

# Chemical Week

October 20, 1951

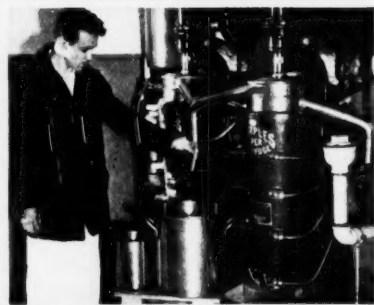
Price 35 cents



◀ **Power will be short thru '53: but chemicals won't be badly crimped; here's why..... p. 11**



**They're "hot", they're vicious; but cool planning, clever engineering dispel isotope dangers ..... p. 20**



◀ **Army's Ames: He forges chemical armor to thwart costly fungus losses ..... p. 25**

◀ **Centrifuges whirl faster, and in more places; reason: improved designs widen fields of use .. p. 29**

**Zinc salts deficit due; U. S. won't pay enough for metal ..... p. 47**

# "Hole in the dike!"



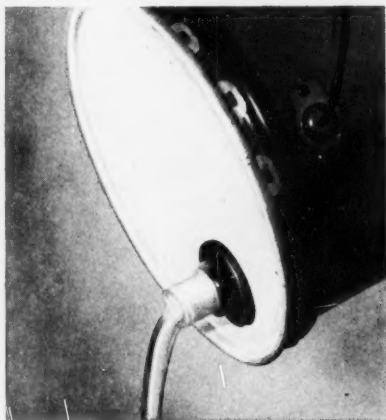
Legend praises the courage of the little Dutch boy who plugged a leak in the dike with his arm until help arrived.

Every closure in dispensing containers is a potential hole in the dike . . . a hole that demands a perfect plug to stop leakage from evaporation, corrosion, mishandling.

That's why FlexSpout®, a new leak-proof and tamperproof sealing spout for containers, is already being used by the hundreds of thousands. FlexSpout is a joint development of Shell and the facilities of Rieke Metal Products Corporation.

FlexSpout, made of polyethylene resin, combines all three desirable features of the ideal chemical closure . . . a flexible "pull-out" spout; a strong, leakproof, tamperproof closure; and a remarkable resistance to chemical attack. FlexSpout is now a feature of Shell Chemical 1- and 5-gallon containers, and its use has spread throughout the packaging industry.

The FlexSpout closure is another example of Shell's search for better Service . . . for the users of industrial chemicals.



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# Chemical Week

Volume 69 Number 16  
October 20, 1951

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## FASTER FILTRATION— CLEANER FILTRATE WITH EIMCO PRECOAT FILTERS

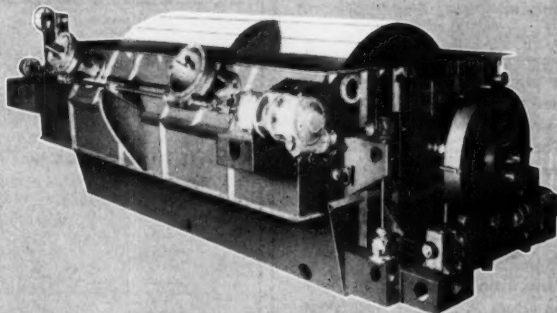


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## OPINION . . . . .

### What's Your Opinion?

Just who decides whether a magazine should be published weekly or monthly, what its editorial character and content should be? That's a question you ask us frequently. And this is the answer: You do.

No magazine is, of course, published "in a vacuum." We as editors make the day-to-day decisions—which stories will run in the "lead" spot, how much space they will be given, what new developments or trends warrant thorough (and often costly) investigation, which is the significant news, which is the trivia. Nonetheless, all our decisions stem from what we think are your business interests, your informational needs, your likes and dislikes.

Obviously, it is only by knowing just what your tastes are that we can publish the kind of magazine which is of maximum usefulness to you. That's why I am asking you now for your opinion of **CHEMICAL WEEK**—your candid views on the job we are doing for you.

As you may remember, it was almost a year ago that we converted the then-monthly **CHEMICAL INDUSTRIES** to **CHEMICAL WEEK**. (That decision, by the way, was made only

after querying some 6,000 chemical magazine readers and business men about their needs and reading habits.) And the first issue of our interpretive newsweekly made you a promise.

We said—and this was back in January—"Our sole objective is to supply you in concise, readable form with the essential information you need to function as key men in our vital industry."

"We want to make CW your friendly confidant, your capable and competent companion, your obedient servant that promptly brings you the news you want, when you want it, in the way you want to read it."

How well have we succeeded? That's the question that my associates and I would be glad if you would answer. We'll welcome your frank comments, criticisms and suggestions. It will help us to make CW more helpful to you.

—**W. Alec Jordan, Editor**

*P.S. Here's a handy "memo" for your use. Of course, should you care to write to me more extensively I'd be all the more grateful.*

Memo to Alec Jordan  
330 West 42nd Street  
New York City 18, New York

I like most about CW:

I dislike most about CW:

Name .....

Title .....

Job Function .....

Nature of Business .....

# Are you turning in all your SCRAP?

*Don't wait for "George" to do it*



You'll find your local scrap  
dealers listed in the yellow  
pages of the phone directory.



1-1348-A

**I**F you are a steel user, this important job of getting more scrap back to the mills is directly up to *you*. You just cannot afford to sit idly by while the scrap shortage gets worse. For unless everyone really pitches into this job of digging out all the scrap possible, steel production is bound to suffer, and every steel user, in more or less degree, will suffer too.

More scrap means *more* steel—it's as simple as that.

Right now some mills have only a bare two-days' supply of scrap on hand. Others have even less. Some steel-making furnaces already have had to shut down for lack of scrap. The situation is serious. Only you can help improve it.

By turning in every piece of worn-out equipment, every obsolete tool and machine, in fact every pound of iron and steel scrap you can comb out of your plant, you'll be helping relieve the worst scrap shortage since Pearl Harbor days . . . and the steel industry will be able to produce more of the steel you need.

Remember—it takes at least one-half ton of scrap to make one ton of steel. To maintain steel's present high production schedules requires more than 1400 carloads of industrial scrap *every* day. So turn in your scrap—**ALL** your scrap—and keep the mills rolling. This is more than a shortage. It's an emergency that vitally concerns you—and us—and the Nation.

All the SCRAP you  
can scrape up  
is needed - and  
needed  
**NOW!**



This page would ordinarily be used to tell you about

## **U-S-S COAL CHEMICALS**

but, because the SCRAP situation is so serious,  
we are asking instead for your all-out help in getting  
more SCRAP to the mills.

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## OPINION . . . . .

### Cents, Not Percent

TO THE EDITOR: . . . The Texas Natural Gas gathering tax ("Freight-Tax Squeeze," Sept. 22) is 0.45¢ per thousand cubic feet at 14.65 psia pressure base, effective Sept. 1, 1951. It is imposed on the first natural gas taker beyond the well, or if the gas is processed through a natural gasoline plant, then first taker beyond the gasoline plant pays the tax.

It is expressed in the law as 9/20ths of 1¢ per thousand cubic feet, etc. The note . . . in your news article is therefore erroneous to the extent that the percent sign should have been a cent sign.

R. W. SWANSON  
Kansas City, Mo.

Right, Reader Swanson. CW was wool-gathering when it said, senselessly, 9/20ths of 1¢ per 1000 cu. ft. All the other facts were, of course, correctly reported and interpreted.—Ed.

### Patent Gists

TO THE EDITOR: I would like to comment upon the article "Isolation, Not Enough," (August 11) . . . especially the last two paragraphs thereof. This article reports the "gist" of a recent decision of the Board of Appeals of the U. S. Patent Office involving chemical subject matter.

The last two paragraphs of your article, which are not quoted from the decision, purport, as I read them, to state what the decision meant. The language used is clear and easily understandable to patent attorneys who are accustomed to considering legal opinions. Unfortunately, however, and this has become increasingly plain from questions asked me since the publication of this report as well as other previous similar reports, such is not the case with professional chemists . . .

The interpretive paragraphs of the report . . . amount, it seems to me, to a sort of incomplete and anonymous legal opinion. I am sure you are well aware of the fact that when an attorney renders an opinion, he does not do so anonymously and he does so only in the light of his admission to practice and his thus-attained position of an officer of the court in which he practices.

It is submitted, with due respect, that while reference to interesting chemical subject matter reported upon by a court of last resort (which, it is noted, the Board of Appeals is not) can be newsworthy, and thus proper subject for discussion in your otherwise excellent publication, weekly

magazines are no place for legal opinions.

Again, attorneys will scarcely be troubled by this problem from the standpoint of accepting your advice, but the large number of chemists who read your publication run, it seems to me, the risk of being misled. . .

. . . I think you should re-examine your policy with respect to the rendering of legal opinions in your publication and that the service that you render . . . will be enhanced, rather than otherwise, by their deletion.

THORNTON F. HOLDER  
Patent Counsel  
Diamond Alkali Co.  
Cleveland, Ohio

A thoughtful and thought-provoking opinion, Reader Holder, and a sound cautionary note. It is our responsibility, we believe, to report significant chemical patent decisions and as much as is possible, in layman language.

Our interpretations—which are, incidentally, prepared in consultation with a patent lawyer—are admittedly anonymous, brief, one opinion. They should not, of course, be regarded as dogma nor as a replacement for legal counsel.—Ed.

### The Next Decade

TO THE EDITOR: We would appreciate your forwarding several reprints of your article "Ethylene Chemicals—The Next Decade"—(Sept. 29) . . .

If you do not have reprints available, kindly forward copies of the magazine for our use. . .

F. L. SCOTT  
Purchasing Agent  
Natural Gas Pipeline Co. of America  
Chicago, Ill.

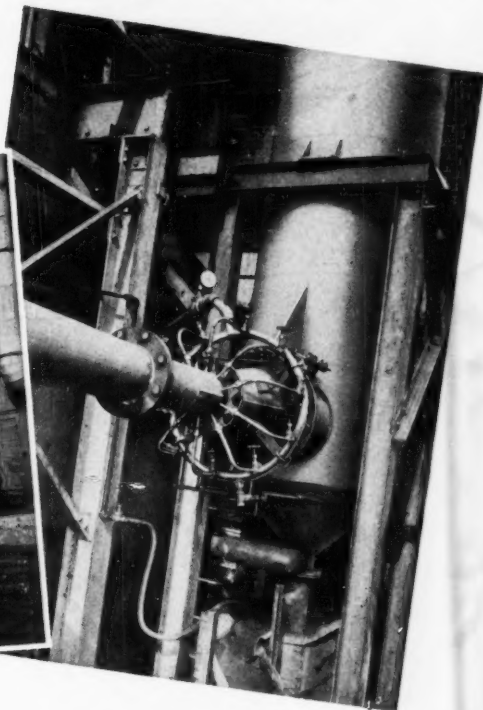
In answer to the scores of readers who have written (and telegraphed) us similar inquiries, this is the situation: Our supply of copies of the magazine is exhausted but a third run of reprints is now on press and copies of the report will soon be available at the following rates: 1 to 4 copies, 50¢ each; 5 to 10, 40¢; 11 to 25, 35¢; 26 to 100, 30¢.—Ed.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 18, N. Y.

# Here's Efficient **DUST** and **FUME** Removal

Recently installed at the Philadelphia plant of the Electric Storage Battery Co., this Pease-Anthony Venturi Scrubber is effectively reducing fine dust emissions from a secondary lead smelter. The dust composed largely of sub-micron particles is removed from the furnace gases.



## Other Typical Applications



Chemico P-A Venturi Scrubbers are now being used in a wide range of industries for the highly efficient removal of micron and sub-micron dusts and fumes. For a detailed analysis of your scrubbing problem, write or call our P-A Sales Department.

APPLICATION	MATERIALS BEING REMOVED	DUST AND FUME LOADINGS	
		Inlet to Scrubber	Outlet from Scrubber
DUSTS			
Diatomaceous Earth Plant	Diatomaceous Earth	1.2 grains/scf	0.05 grains/scf
Rubber Blenders	Carbon Black	0.3 grains/scf	0.003 grains/scf
Yellow Brass Foundry Furnace	Zinc Oxide	3.5-10 grains/scf	0.7 grains/scf
Lime Kilns	Lime and $\text{Na}_2\text{O}$ Fumes	7.0 grains/scf	0.02 grains/scf
Electric Furnace Fumes	Iron Oxide	0.2 grains/scf	0.03 grains/scf
Blast Furnace	Iron Oxide	4.0-20.0 grains/scf	0.004-0.08 grains/scf
Secondary Lead Blast Furnace	Lead and Rubber Compounds	1.10 grains/scf	0.05-0.20 grains/scf
FUMES			
Copperas Roasting Plant	$\text{H}_2\text{SO}_4$ Mist	100-300 Mg/scf	1.5 Mg/scf
Titanium Plant	$\text{H}_2\text{SO}_4$ Mist	120 Mg/scf	2.0 Mg/scf
Phosphoric Acid Plant	$\text{H}_3\text{PO}_4$ Mist	100-300 Mg/scf	3.0 Mg/scf
Wood Distillation	Tar Fog and Acetic Acid Mist	1000 Mg/scf	10-40 Mg/scf
Enamel Smelting Furnace	Dust and Fluoride Fumes	55.0 Mg/scf	4.0 Mg/scf
Dry Ice Plant	Amine Fog	25.0 Mg/scf	5.0 Mg/scf

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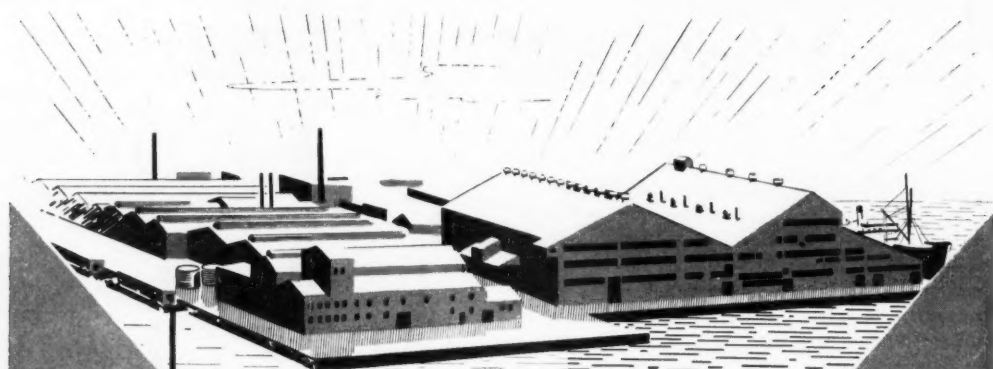
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## NEWSLETTER

Major company developments are stirring up talk this week:

Carbide and Carbon partly lifted the shroud of secrecy surrounding its long-time development work (CI Newsletter, July 1947) on depolymerization of coal by high-pressure hydrogenolysis.

In a research brochure just published by its parent organization, Union Carbide, such process possibilities are stressed as production of phenols, aryl amines, quinolines.

But the real "kicker" is the firm's suggestion of actual work at its plants: "At Carbide's . . . plants, the coal depolymerization facilities . . . provide . . . for . . . large-scale process studies and for the evaluation of many new products as they become available for the first time."

Carbide's willingness to reveal its activities may indicate that the coming revolution—more chemicals from coal—is nearer than you think.

Minnesota Mining and Manufacturing Co. expects to boost its export sales from \$5 million last year to \$30 million next year through its formation of a wholly-owned international subsidiary.

The 3-M company formerly sold abroad through the Durex companies, which were dissolved earlier this year by the Government.

Quantity production of a series of fluorocarbons is another news-making 3-M development. Its semi-commercial plant at Hastings, Minn., has been completed and is now operating.

Another international venture is Pennsalt's just-signed agreement with Caffaro Electric and Electrochemical Co., Italy, for exchange of patents and industrial know-how.

Caffaro is also expanding its plants with Pennsalt's help.

Dewey & Almy is going out after an immediate tenth of the U. S. battery separator market (total: 2,500 million a year) with a new type consisting of paper impregnated with rubber.

Chief selling point: It's in the same price range as—but better than—wood separators; and it's a lot cheaper than plastic, hard rubber or glass fiber fabrications.

One battery maker, Gould, is already signed up; and it's a good bet that the 250 million-units-a-year plant will soon be enlarged.

Drug firms are also in the news with new plants, new products:

Schenley Laboratories is going ahead with antibiotics expansion at Lawrenceburg, Ind., will boost its output 30% next year.

Parke, Davis & Co., apparently convinced that synthesis is the best route to chloromycetin, is building a plant near Holland, Mich., which will more than double the company's current capacity.

Eli Lilly & Co. is now making the antimalarial, primaquine, commercially; but the military services are taking the entire output.

Upjohn Co. is now producing (at Kalamazoo, Mich.) and marketing neomycin. Likely field for the new antibiotic: dermatological use.

## NEWSLETTER

Look for news soon of pharmaceutical applications for some of International Minerals & Chemical Corp.'s amino acids.

Two amino-type products look especially good for therapy in several diseases. Details will come out in a soon-to-be-published issue of Annals of Western Medicine and Surgery.

Rumors of the impending news have sent IM&C's stock from 32 to 44 $\frac{7}{8}$  in the short space of two weeks.

No expansion yet, but evidence of some on the way: National Aniline Division has bought 34 parcels of land near its Buffalo plant.

Chances are that the Government will work out some deal to assure success of Spartan Aircraft's proposed aluminum plant at Little Rock, Ark. (CW Newsletter, Sept. 29).

Arkansas Senators McClellan and Fulbright (Dem.) are pushing the project, have talked it up to DMPA head Jess Larson.

Best guess is that DPA will issue a certificate of necessity and help find construction materials, and DMPA will find some way of buying the output or otherwise guaranteeing profitable operation.

Discovery of new sulfur domes has upset many industry plans to install sulfur recovery systems. Firms don't want to be caught with high-cost installations if cheap, Frasch-mined brimstone is plentiful.

But in the shortage-sure interim controls will be clamped on sulfur. DPA has outlined a program, and NPA will probably issue an order effective November 1. Upshot: Fertilizer makers will get about 10% less than in 1950, the saving plus new supplies will go to chemicals and export.

It looks as if DPA's moratorium on certificates of necessity will be extended for at least another 30 days. Probable reason: DPA hasn't yet been able to get a clear picture of what's going on. Some companies are expanding capacity without benefit of quick amortization, and some that have received certificates aren't using them for one reason or another.

NPA's Chemical Division had 750 applications on hand when the "freeze" was imposed; total construction value: \$2 billion.

About 250 were approved at the time and forwarded to DPA. About 440 are under "active consideration"; i.e., most of them will be recommended to DPA. The 60 or more remaining were thrown out.

Don't put any stock in the talk that DPA and NPA will merge. Chairman Patman (Dem., Texas) of the House's Small Business Committee, wants NPA pulled out of the Department of Commerce and placed under the independent DPA. He says small businessmen fare poorly under CMP.

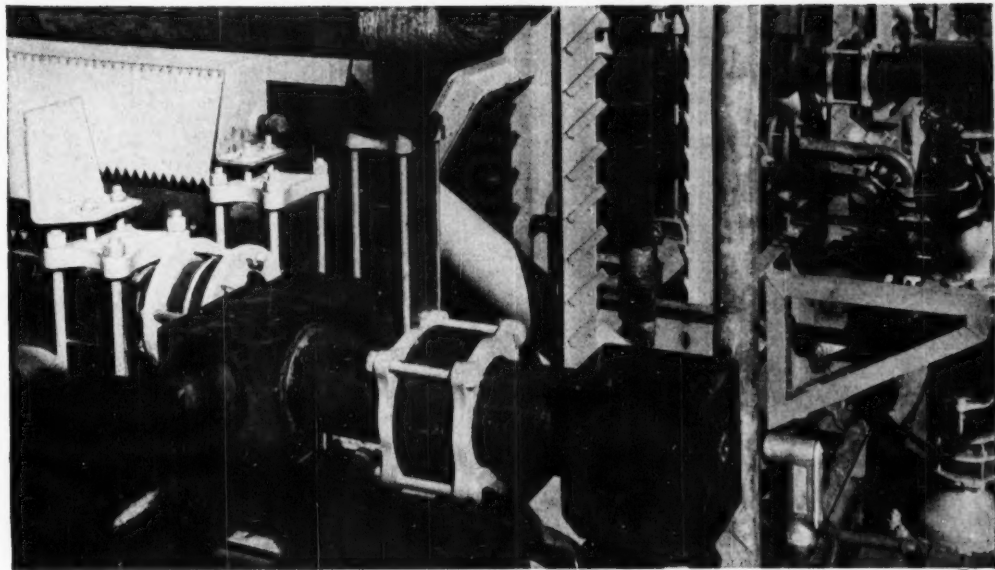
But observers point out that (1) small business gets better-than-average treatment by NPA, (2) small business wouldn't get any more materials if the agencies were merged, (3) Patman is playing to the galleries, and (4) he doesn't like Secretary Sawyer. Actually, the two agencies already function as a single unit in many spheres, and Fleischmann runs both.

Two examples of industry-education cooperation: TVA and the University of Mississippi will sponsor a one-day institute to give professors of the region a chance to learn TVA's ammonia technology . . . Columbia-Southern Chemical Corp. is establishing a \$15,000-a-year chair of chemical engineering at Carnegie Institute of Technology, Pittsburgh.

... The Editors

QUESTION:

# What pipe handles ALL corrosives?



COURTESY OF TENNESSEE PRODUCTS AND CHEMICAL CORPORATION

ANSWER:

## "KARBATE" BRAND IMPERVIOUS GRAPHITE

For conveying, processing and storing *all* types of corrosive liquids and gases, hot or cold, whole systems are now being built 100% with "Karbate" impervious graphite pipe, fittings, valves, pumps, heat exchangers, towers and other units needed. Here are the reasons:

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★ "Karbate" impervious graphite pipe keeps production rolling. You don't have costly "down time" because of corrosion in the system. There is no loss of product.

### PLUS FACTORS OF "KARBATE" IMPERVIOUS GRAPHITE PIPE:

- Both acid resistant and alkali resistant
- Light in weight, easy to machine and assemble
- No metallic contamination of product
- Immune to thermal shock

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It's the "Eveready" No. 1050 flashlight battery, made with the zinc electrode inside a carbon jacket - just the reverse of every other battery on the market.

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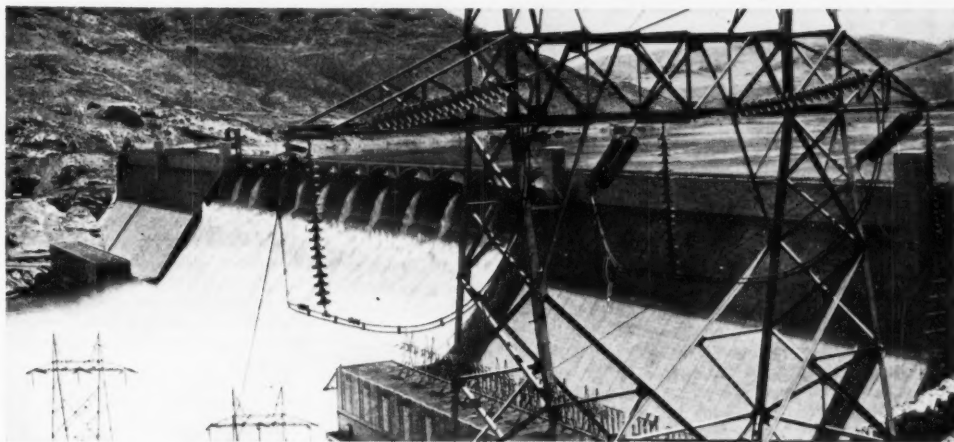
DEPENDABLE AS A SOURCE . . .  
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and Gilman, Alabama

*If your product fits into a bag — we'll make the bag to fit your product.*

## BUSINESS & INDUSTRY . . . . .



POWER: As critical as steel, as basic as salt, as worrisome as sulfur.

### Power Squeeze for '52

Despite production records, power companies will fall short of expansion goals. Culprit: lack of steel.

Outlook: Supplies will be tight for two years but most chemical companies report they will get by.

In most areas, the situation should improve by 1954, unless industrial expansion strains the seams.

All over the country this week chemical men are taking a hard look at power supplies as they visualize the disastrous implications of a full-fledged power shortage. Although any shortage—present or future—is simply an additional phase of the steel shortage, there is little consolation in the fact.

Since World War II power producers have been anticipating a shortage and have plotted their expansions accordingly. By the end of this year installed capacity should surpass 75 million kw. The schedule calls for 8 million more by the end of next year, another 11 million in 1953. Their inability to get steel, however, means that producers will fall short of their goal next year, possibly by 4 million kw. A similar 4 million kw. "slippage" for 1953 would mean that installed capacity by the end of 1953 would be 86 million kw. instead of the planned 94 million. For consumers it adds up to a

power squeeze starting in 1952, continuing through 1953.

By and large the chemical industry figures to fare better than most. One reason: Many of the companies generate a large share of their own requirements. Another: The industry can lay claim to some farsighted thinking in foreseeing a shortage and taking steps to avoid it (although it is by no means unique in that respect).

Carbide and Carbon's heavy power user, Electro Metallurgical Co., for instance, is now consuming 500,000 kw. (90% of the time). By the end of 1953 it will require 700,000 kw., but will be generating 540,000 kw. for its own use. Du Pont reports that it is not too alarmed about a power shortage; it too generates a large share of its own requirements.

Monsanto says that its power needs have been anticipated, and Victor Chemical still schedules its Silver Bog operations to come in this month.

On the other hand, Dow says that it is bringing in new plant capacity faster than it can deliver power. As a result there's a production delay on some new units and it will be several months before the situation is cleared. For most of the other companies, the power outlook varies with the location of plants.

**Northwest:** The Northwest has long been considered one of the most critical areas in the country; and events in recent weeks substantiated original estimates. A rundown on the rapid succession of conflicting developments there looks like this: (1) The Bonneville Power Administration dropped 245,000 kw. of interruptible power (CW, Sept. 29). (2) Defense Mobilizer Wilson offered his short-lived proposal that some of the aluminum producers move out of the area. (3) Congress started a move to authorize fuel-fired generating plants. (4) The unusually dry summer was blamed for the shortage. (5) The unusually dry summer was not blamed. (6) Rainmaker Irving Krick was called in. (7) The rains came and BPA restored full service.

At present the situation is well in hand. Government dams now a-building will double present generating capacity. Private utilities are also building—or seeking permits to build—hydroelectric facilities. Current efforts, however, will not pay off until 1953 at the earliest; and in the mean-

time industrial expansion in the area will be sharply curtailed. Only further demands on the system will cause future shortages.

**Southwest:** There is presently no shortage of power in Texas. But big industrial expansions (including such heavy power consumers as Ethyl, Dow, Diamond Alkali, Columbia-Southern, Reynolds) are putting a strain on present facilities. The situation is not as bad as it might be since aluminum companies are generating their own power. Dow is doubling its present big power plant, but Diamond, which has been furnishing its own thus far, will have to purchase power to take care of its expansion program.

Power companies are trying to keep ahead of the demands by their own expansions. One big utility in Houston has doubled its capacity within the last five years, is now adding 400,000 kw. to double it again in the next three years. As elsewhere, the power companies have been held back by government controls on equipment.

Because of the situation, the outlook is for a tight power supply in the Southwest until 1954. At that time much of the power expansion will be in service, and supply will ease. If, however, industrial expansion continues along at the present rate, power supplies will remain tight.

**Southeast:** Virginia-Carolina's plant, near Charleston, S. C., and Pittsburgh Metallurgical Co., in Charleston, have been curtailed in the use of power they receive from Santee-Cooper, the South Carolina Power Authority. Although both have been offered power by private utilities, they have refused it because it would be more expensive. Chemical Products Corp. (Cartersville, Ga.) reports that it has not heard of any possibilities of curtailment in the area. Tennessee Products & Chemical Corp.—getting power from TVA—does not anticipate any shortage. TVA, however, is taking on large customers only on an interruptible basis.

Many of the big utilities in the Southeast are not only meeting demands but looking for new customers. On the whole, the outlook for power supplies in the Southeast is favorable.

**Midwest:** Around the Cleveland and Ashtabula areas in Ohio, there is no present shortage of power. Expansions by Diamond Magnesium, National Distillers, Electromet and Diamond Alkali will require about 85,000 kw. within the next year or so. But Cleveland Electrical Illuminating added 150,000 kw. this year, has facilities under construction to add

375,000 kw. within the next two years. New generating facilities will be in operation before additional power is required by the expanding chemical industry.

In Chicago, there is no foreseeable shortage for the coming winter, but there will be no reserve capacity. The situation will get tight in 1952, particularly in November when new steel mills start up.

**Northeast:** The New England states look like a good bet to get by for the next two years without any lack of power. The same holds true for most of the Middle Atlantic States, particularly in the area around New York City. In the Buffalo-Niagara Falls region the picture is not so encouraging. Four big electrochemical firms report they are being presently curtailed on the use of power. They say they can get plenty of 60-cycle power, but their equipment is set up for 25-cycle. New equipment, on order or being installed, will use 60-cycle.

## Chem Corps Sales

Chemical Corps suppliers have a new system to work with this week. As a result of the reorganization of operating set-up within the Corps, (CW, Sept. 22) each of the seven regional procurement offices is now responsible for a specific type of supply.

The new materiel command, under Brig. Gen. Henry M. Black, has inaugurated the new system to speed up procurement. Procurement information will still be available on any item at any of the district offices, regardless of which office is in charge of buying the particular item. But once the seller is ready to put in his bid, he must go to the specific office in charge of buying that item.

Offices, and their major purchasing authority, are:

- Boston—protective devices used in defense against chemical, biological, and radiological agents.
- Dallas—metal parts used in making incendiary bombs and smoke ammunition.
- New York—bleaches, decontaminating solutions, flame throwers, napalm.
- Chicago—decontaminating apparatus, some types of incendiary bombs.
- San Francisco—smoke generators and tear gas grenades.
- Atlanta—white phosphorus, identification kits for chemicals.
- Army Chemical Center, Md.—everything for Edgewood arsenal, research and development contracts, and new or proposed items.

## Cash in their Jeans

Texas and Oklahoma farmers are reaping the profits from the sale of their first big castor bean crop. New on the domestic scene, castor cultivation is probably here to stay; the Government guarantees a good price for the bean, industry will take all it can get.

The harvest began last week when the Commodity Credit Corp. opened the doors of its new hulling plant at Brownwood, Tex. One day later a similar plant at nearby Stephenville announced it was open for business.

Profit on the new crop is substantial. The first beans hulled at the Brownwood plant brought a little more than 10¢ a pound. Figure the cost of hand-harvesting and hulling at about 3¢ a pound; and that leaves a tidy return on the farmer's back-breaking efforts.

But the job won't be back-breaking much longer: Sixty harvesters designed for the new crop by agriculturists at Oklahoma A & M College are now en route to the castor-growing areas for use later in the year.

**Lots More to Come:** Castor bean acreage in Texas and Oklahoma totaled 56,000 this year—a mere drop in the bucket compared to plans for the future. The Fats and Oils Division of the U.S. Department of Agriculture has set its sights on 200,000 acres in 1952, but even this sizable boost won't meet industry's requirements. The Baker Castor Oil Co. alone would like to see half a million acres under cultivation.

This all-out expansion bodes well for the industrial future of the bean-growing area. Hulling plants at Brownwood and Stephenville are geared only for the average yield from 6,000 acres; new facilities are a dead certainty. Furthermore, castor oil processors may soon find it to their advantage to build processing plants in the Southwest. Most such installations are located in the Eastern and Western Seaboard states—a long haul from Texas and Oklahoma.

In recent years it has become increasingly evident that the Latin American countries—our major suppliers—can't keep pace with American demand for the oil-bearing bean. Defense production is now imposing another heavy burden on an already shaky supply situation.

Castor oil processors have long hoped for a stable domestic raw material supply to liberate them from dependence on temperamental foreign sources. It now looks as if their hopes will be realized.

## Colchem Hassle

Secretary of the Interior Oscar Chapman and investment-banker Ferdinand Eberstadt are trying to breathe life into the presently-stalled (CW, Oct. 6) Colchem Corp. project (erection of a plant to hydrogenate coal for the production of chemicals and/or liquid fuels). Refusing to give up, Colchem recently acquired an option on 38,000 acres of coal land in Southern Illinois.

According to the script, only private capital (\$400 million) would be used. But it would be an unusual venture for "risk" capital. The investors would be protected from loss either by a set of government-guaranteed prices for the products or by a government guarantee to buy all of the output at a fixed price over a period of years.

The project was first offered to the public about a year ago by the Synthetic Liquid Fuels Div. of the Bureau of Mines as a means of relieving the benzene shortage. Opposition to a government-built and government-operated plant soon became too great. A few months elapsed and the project reappeared in its present guise. But many chemical economists are sure that Uncle Sam will pick up a rather sizable tab and, willy-nilly, he will also be in the chemical business in a big way.

To make the project appear more attractive from a dollars-and-cents viewpoint, much stress has been placed on chemical manufacture. But the quantities of these products that would be provided by the proposed 30,000 barrel-a-day unit would be so huge, some think that the whole chemicals market would be disrupted. Using as a basis the product analysis from the Bureau's demonstration plant at Louisiana, Mo., the proposed facility would provide a quantity of toluene nearly equal to 1950 production; a volume of mixed xylenes nearly equal to 1950 production; a similar increment for phenol; and a volume of tar acids nearly five times 1950 requirements.

**Nary a Penny:** Both Eberstadt and Interior spokesmen suggest that the project would cost the government nary a penny when the products are sold at current prices. But both parry questions about where these products could be sold without depressing current prices. Trends that would increase the nation's need for aromatic chemicals are pointed out. But with the single possible exception of benzene, it takes a convulsion like war—not a gradual trend—to absorb the



CHAPMAN AND EBERSTADT: "Colchem-ists."

volume of chemicals that would be manufactured.

**Less Research:** Interestingly enough, government research on synthetic liquid fuels is soon to suffer a sizable curtailment. The last Congress appropriated money for this purpose after the end of the fiscal year and attached a rider that cut all appropriations, except certain military expenditures, by 10%. During the first half of this year expenditures have been running at last year's rate; but beginning some time in November cut-backs will have to be made to live within the appropriation.

**Long Term:** Because the sponsors refuse to take any risks whatever, many think it's undesirable for the government to get into it any deeper. But there is a long-term aspect that should not be forgotten. As has often been reiterated, the nation will eventually exhaust its supply of liquid fuels. But at this early stage it would appear that expenditures for research, not steel-hungry operating plants, is more in order.

## Wood Pulp Next

Already the largest producer of household soaps and synthetic detergents, Procter & Gamble is now moving into the chemical wood pulp field. As its first solid step in activating a certificate of necessity (65%) granted some time ago for a dissolving pulp-from-wood plant, P & G's subsidiary, Buckeye Cellulose Co., has purchased 465,000 acres of woodland near Foley, Fla. No price was divulged, but it is undoubtedly in excess of \$5 million.\* The move is a logical one. P & G has long been an important producer of

\* Hudson Pulp & Paper Corp. recently paid \$3.5 million for 240,000 acres in the same area.

cotton linters as a by-product of its cottonseed crushing operations. Despite the fact that P & G crushed 10% of all cottonseed crushed in this country in 1950, cotton linters have fallen short of supplying the company's chemical cellulose customers for some time. Addition of wood pulp was all but inevitable if P & G was to maintain its position as a major supplier of chemical pulp.

**Soap-Synthetics Supreme:** While the new expansion into wood pulp is a major operation, P & G's big eggs are still in the soap and detergent basket. At present over 60% of the company's business is in the manufacture of soap, glycerine, synthetic detergents, and cleansing and polishing compounds.

The company has no intention of being caught napping on future developments, as Lever Bros. was on synthetics, and is now adding a new research laboratory near Ivorydale. This new lab adds further strength to the research staff already numbering 500 technically trained men. At present P & G spends 1-1½% of its sales for research.

Edible fats and oils, such as Crisco, make up P & G's second biggest item, dollar-wise, representing about 25% of total sales volume.

**Synthetics Shine:** While the company does 25% of the country's home soap business, it is in the synthetic detergent field that it really shines. Some reports place P & G sales as high as 50% of the total synthetic market. Although it is a company policy to have excess capacity, it has never been able to reach this stage with synthetics.

Beginning production in 1933 with the sodium alkyl sulfate type, Drefit,

the company is now producing alkyl aryl sulfonate types as well. Variability in the price of fats and oils makes it difficult to predict where synthetics will level out, but P & G doesn't seem to expect the plateau for some time, and is reportedly building an additional sodium alkyl sulfate plant at Kansas City, Kan.

At the same time it is obvious that only the three big soapers, P & G, Colgate-Palmolive-Peet, and Lever, have the machinery to sell all the alkyl aryl sulfonate detergents that will be provided by a huge new alkyl benzene plant now going in on the West Coast. Its 300 million pound per year capacity is greater than the total output of alkyl benzene in 1950.

**Future:** P & G will remain a dominant factor in the home detergent market for some time to come. But in all probability its percentage of the total synthetic detergent sales will drop, although poundage produced will continue to increase. **Late-starter** Lever Bros. will be bending every effort to catch up, and go ahead with new developments, but research-wise P & G seems better prepared for the future than Lever.

The new move to expand its cellulose production; planned moves into dentifrices and liquid detergents; and expansion of its already dominant synthetic detergent facilities, augur continued dominance for P & G. Research-minded, and willing to move out in new fields, the company has cut a large chunk of the soap-detergent-cellulose-fats industry for itself, and is looking for more.

## Chicago: A New Lead

Hard by the spot of history's first atomic pile, the city of Chicago this week launched the first municipal program to handle some growing problems tied up with peacetime atom development. The start: creation of an advisory committee slated to meet next week to devise ways and means to treat the hazards of radioactive wastes.

Godfather to this forward-looking enterprise is Dr. Herman N. Bundesen, president of the Chicago Board of Health, and long-time campaigner for healthier Chicago citizens. Bundesen is all for meeting these problems now while they are still in embryo. Says he, "We must guard against . . . possible abuse should [the wastes] fall into careless or improper hands."

**Limits Set:** The new agency will exercise control over such private users of radioisotopes as hospitals, cancer research foundations, and industrial laboratories. The Atomic En-



BUNDESEN: Handles a hot issue.

ergy Commission, maker and purveyor of these isotopes, has little say-so on the disposal of radioactive wastes. But Bundesen counts on AEC's chairman Gordon Dean to tell him who uses the isotopes in the Chicago area, and to determine the scope of AEC jurisdiction in the Chicago city limits where the new agency would operate.

**Who's There:** The agency roster is still in the choosing-up stage, but most of the members will be drawn from radiologists and atomic scientists around Chicago. From their combined knowledge and experience, Bundesen hopes to achieve a new municipal safety and health code in handling and disposing of radioactive wastes.

**Poser Quartet:** Many knotty-and-new questions will confront the committeemen for all their experience. Such posers as these will need to be answered:

- Will drains, traps, or utility pipe lines become "hot" spot hazards?
- Would radioactive wastes upset the biological balance of sewage disposal?
- Would a radioactive "cemetery" be needed, and—if so—what kind?
- If the wastes are to be burned, what are the hazards from flue gases?

**Chicago Plans:** In meeting these problems, the committee can only recommend, but responsibility for action will devolve upon the city government. A long time may elapse before the Chicago committee is satisfied with results, but at least a start has been made. And to many, it is perhaps fitting that Chicago, birthplace of the A-bomb, should also take the lead in tackling the problems arising from peacetime use of the atom.

## Up and Over

NPA sees BHC and DDT capacity ample for next year's domestic insecticide needs and export requirements as well. But all producers are not sure raw materials will be forthcoming; also think more intelligent handling of export licenses would enable them to cultivate overseas market to complement domestic agricultural season.

The National Production Authority meeting with Benzene Hexachloride and DDT Industry Advisory Committees recently has concluded that about 125 million pounds of BHC and 105 million pounds of DDT will be required next year. That includes both domestic and export needs.

The breakdown for BHC is 85 million pounds for domestic use and 40 million for export, both figured on the basis of a technical product containing 12% of the gamma isomer—the active principle in BHC. For DDT, it is 90 million pounds here; a minimum of 15 million abroad.

These export goals, worked out by the Office of International Trade and the Economic Cooperation Administration, are, in the opinion of Philip H. Groggins, chief of the Agricultural Chemicals Section of NPA's Chemical Division, the groundwork for an enormous, post-emergency export trade in agricultural chemicals. He finds evidence of this in a detailed statement OIT and ECA have recently given him showing how they intend to distribute DDT under DO ratings. This statement calls for export of 20 million pounds instead of 15 million\*.

Groggins points out that pesticides are a matter of life and death in foreign countries where food supplies and health levels are low, sees such an export program as more than mere trade. But he says that importing nations need the same assurances of supplies that domestic agricultural interests and health officials have in planning farm and sanitation programs, urges "high level" consideration of the subject by insecticide manufacturers.

**In Agreement, But:** Manufacturers can find little to argue about in the aims of such program nor in how valuable to them a solid export market would be. They do, however, feel a little less certain than NPA about the availability of raw materials—chlorine, benzene, and sulfuric acid

\*Reason for the discrepancy: ECA and OIT figured out world requirements for DDT, and when foreign production was subtracted, there was a deficit of 20 million it hoped U.S. could supply. But NPA said they could have only 15 million.

—to meet the established goals, the domestic insecticide requirements for next year, and getting export licenses in time to fill orders.

Capacity for both BHC and DDT is ample: BHC's is now about 140 million pounds, may hit 170 when expansions come in; and the DDT production goal of 105 million pounds next year leaves 10 million pounds capacity "in reserve", says NPA. The 115-million pound-per-year capacity for DDT, however, is viewed by some as a bit optimistic.

Although chlorine and benzene are more available than they were earlier in the year, sulfuric acid is still very critical. NPA has assured manufacturers it will help them get the quantities of all raw materials needed to meet production goals. Producers hope they can, but look for no miracles. Says one big DDT maker this week, "I've had enough loose talk; what I need is 50 cars of oleum."

No one can say that the BHC and DDT output scheduled for 1952 is not a whopping one. Yet not all producers will say that it is enough. They point out that although this was not a bad bug year, there has been a negligible carryover of stocks. Should insect populations be normal next year, they feel that the large goals will be the minimum needed.

**Turn About:** Producers are as eager as OIT and ECA to develop a large post-emergency export business.

The domestic insecticide season runs roughly from April 1 to October; that of South America, our principal market, is the reverse. In the past, such export trade has been highly competitive as companies sought to unload year-end stocks. A new awareness of the stabilizing effect this complementary demand can have on business, however, is changing any "dumping" aspect of sales abroad. Companies are aiding foreign consumers in proper use of their products, are also setting up blending and mixing plants in those countries.

But producers accuse the Department of Commerce of tying them up with export licenses, and thus hampering their efforts to develop this market. Commerce has explained that it has held up licenses during the year to conserve sulfur (present in many formulations, particularly the popular 3-5-40 cotton dust containing 40% sulfur) and to maintain an adequate supply of pesticides for domestic agriculture. While most producers accept that explanation as logical, they feel they can take care of both domestic and foreign customers adequately if left more on their own.



BACKFIELD: Nichols, Leppart, Prutton, Osborne plan next move by Mathieson.

## New Team Makes Yardage

The growth-minded management of the Mathieson Chemical Corp. this week took another big step toward solidifying the company's position as a major property holder in the chemical industry. A few hours short of an option deadline it finalized the purchase of Heyden Chemical's holding in American Potash & Chemical Corp. via A. G. Becker, a financial firm. Details of the purchase: 134,725 shares of American Potash stock, price —\$5,389,000.

Simultaneously, Peter Colefax, president of American Potash, revealed that Thomas Nichols, chairman and president of Mathieson; John Leppart, Mathieson's executive vice-president; and three other Mathieson directors were elected to the board of American Potash. These elections came as no surprise, however. For the recent purchase makes Mathieson the owner

of at least 25 per cent of American Potash's stock.

**New Team:** The company and dollars involved in the purchase may have startled some. But there was no eyebrow lifting among veteran observers who have been watching the course of Mathieson since a new management team took over in 1948. Under Nichols (appointed to his present post at age 38), Leppart, Carl Prutton, technical vice-president, and Stanley Osborne, financial vice-president (joined Mathieson in 1950), the company has been beaver busy, a-buying and a-building.

The first acquisition in this campaign took place in early 1949 when Mathieson purchased the complete facilities of Southern Acid and Sulphur Co., Inc., by distributing 265,000 shares of its own authorized but unissued common stock to the common

### Current List of DPA-Certified Chemical Facilities

COMPANY	LOCATION OF FACILITY	PRODUCT	AMOUNT ELIGIBLE	PERCENT
Oldbury Electro-Chemical	Niagara Falls, N. Y.	Sodium chlorate	—	70
Sinclair Refining Co.	Marcus Hook, Pa.	Sulfur	\$ 320,000	80
Southern Alkali Corp.	Natrum, W. Va.	Monochloro-benzene	—	60
The Dow Chemical Co.	Midland, Mich.	Chemical products	—	50
The Dow Chemical Co.	Midland, Mich.	Chemical products	—	50
Union Carbide & Carbon Corp.	Kokomo, Ind.	Alloys	—	70
The Dow Chemical Co.	Freeport, Tex.	Chemical products	—	60-75
Mathieson Chemical Corp.	McKemie, Ark.	Sulfur	198,990	80
The Shamrock Oil & Gas Corp.	Sanroy, Tex.	Sulfur	195,500	80
Shell Chemical Corp.	Houston (Deer Park) Tex.	Epon resins	—	85, 55, 15
Monsanto Chemical Co.	Texas City, Tex. (Styrene plant)	Styrene monomer	—	70
American Smelting and Refining Co.	Leadville, Colo.	Lead	—	60
Whitmore Oxygen Co.	Salt Lake County, Utah	Oxygen	—	60
Phillips Chemical Co.	Funico, New Mexico	Sulfur	1,498,000	80

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FOR ADDITIONAL INFORMATION—  
SAMPLES—WRITE

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stockholders of the purchased company. Among other things, the purchase brought into the Mathieson domain one of the country's most modern and largest sulfuric acid plants and a modern fertilizer plant for the production of pelletized fertilizers. Both installations are in Houston, Texas.

Also in early 1949, Mathieson acquired the facilities of Standard Wholesale Phosphate and Acid Works, Inc., by the issuance of 225,000 shares of authorized but previously unissued Mathieson stock for the 150,000 shares of outstanding stock of Standard. This brought to Mathieson the largest single-unit sulfuric acid plant in the world (Baltimore, Md.) and excellent docking facilities for ocean-going vessels.

**Skyscraper Too:** The expansion drive also involved increasing the size of the home office facilities of the company. In late 1949 a mass migration of executive personnel took place from the Lincoln Building (New York) to a newly acquired 34-story Mathieson Building in the heart of Baltimore.

Late 1949 also saw numerous other expansion and housekeeping projects get underway at Mathieson. A new superphosphate and ammonium sulfate plant was built at Baltimore, a sodium nitrate plant was constructed and a nitric acid plant rehabilitated at Lake Charles, La.

The growth drive continued on into 1950. In the short space of less than two years time the company doubled its total assets, plants, equipment and net income and more than doubled its net sales and surplus. Yet the common stock was only half again what it had been previously . . . a nice accomplishment in any financial league.

**Petrochemicals Beckon:** The year 1950 brought more news of expansion by Mathieson. But it was overshadowed by the big news that the company would split its stock and give the shareholders two for one and by the even bigger news that the company was going to enter the petrochemical arena.

Accordingly, Mathieson Hydrocarbon Chemical Corp. was organized in the spring of 1950 by Mathieson Chemical and the shareholders of Tennessee Gas Transmission Co. Object: to produce chemicals from the liquid hydrocarbons in Tennessee's natural gas line. The manufacture of the chemicals will be accomplished at Mathieson Hydrocarbon's a-building plant at Doe Run, Kentucky, 35 miles southwest of Louisville.

**Merger at Hand:** Last July, directors of Mathieson Hydrocarbon and Mathieson Chemical voted to submit to shareholders a plan of merger of the

two corporations. The merger is also contingent upon a "favorable tax ruling" by Washington officials. But at this point it's a good bet that the plan will get the nod from shareholders and Washington alike. Mathieson seems to have mastered the knack of how to grow gracefully.

## EXPANSION . . . .

**Ethyl Alcohol:** Wood will soon again be a domestic source of ethyl alcohol. Oregon Wood Chemical Co. is again ready to resume production at its Springfield, Ore., plant after a six-month shutdown. A muffling device has been added to the plant equipment to contain the powdered wood refuse that was formerly blown into the air. Plant capacity is between 10,000 and 15,000 gals. per day of 190-proof ethyl alcohol.

Previous plans of the company to produce wax from Douglas fir bark have been shelved for the time being to clear the way for now profitable alcohol production.

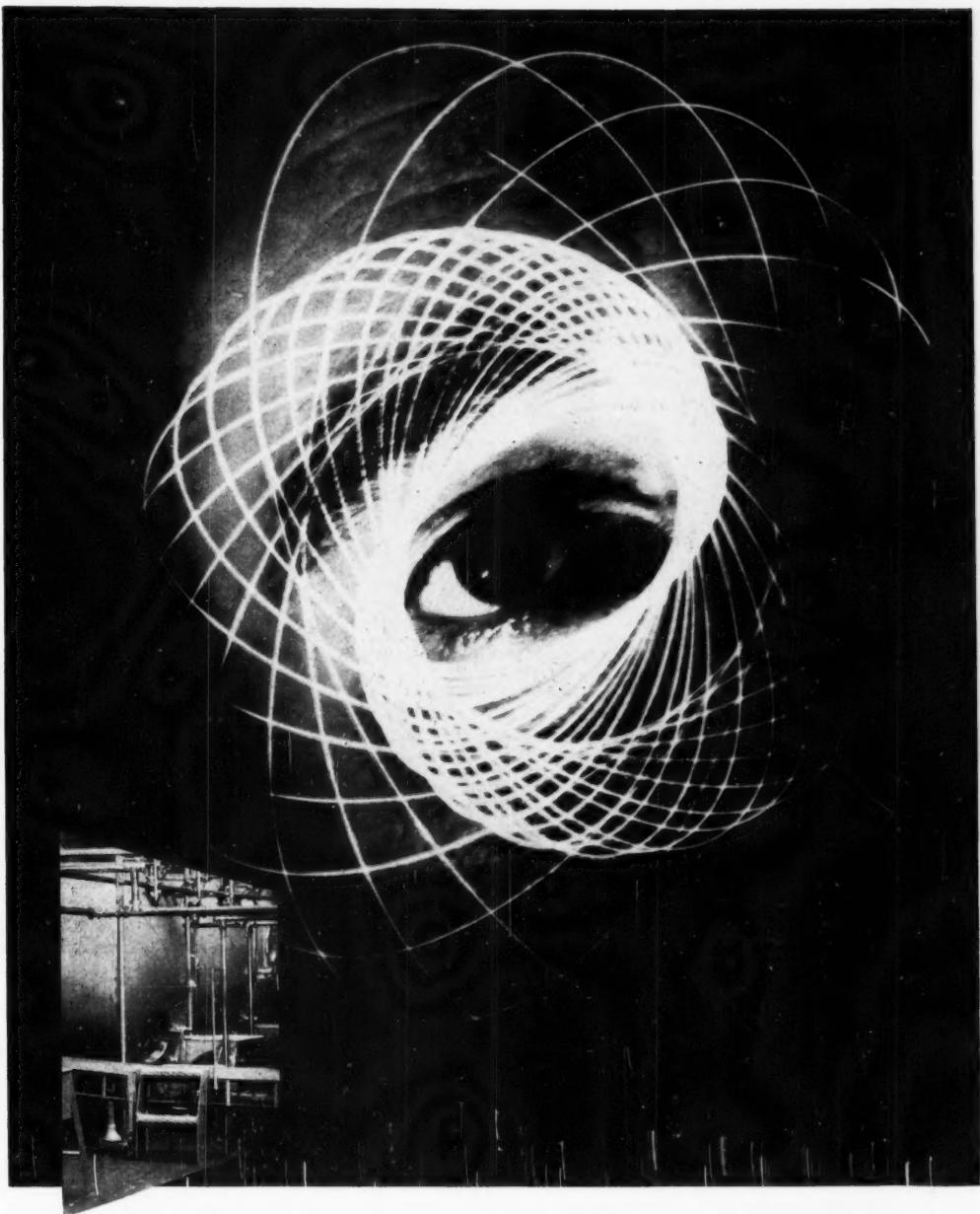
**"Cat" and Reform:** Refining capacity of Gulf Oil Corp.'s refinery at Philadelphia, Pa., is to be increased about 75% (76,000 bbls/day) by an extensive expansion program. Two of the new units are the largest ever constructed: (1) a 125,000 barrel-a-day atmospheric and crude topping unit; (2) a 63,000 barrel-a-day fluid catalytic cracking plant.

Another portion of the expansion is a 10,000 barrel-a-day catalytic reforming unit, the first of its kind for Gulf. Such a unit is capable of producing benzene, toluene and xylenes.

**Commercial Solvents:** To finance the company's new facilities—ammonia, ammonium nitrate and methanol at Sterlington, La., dextran at Terre Haute, Ind., and changes and additions to the penicillin and bacitracin units at Terre Haute—Commercial Solvents Corp. has borrowed \$25 million from institutional lenders on 3 3/4% notes which mature Sept. 1, 1972.

**Hydrogen Peroxide:** Buffalo Electro-Chemical Co. plans to start operation of its \$4.3 million hydrogen peroxide plant at Vancouver, Wash., on Jan. 1. Full-scale production should be under way by September 1952.

**American Resinous Chemicals:** American Resinous Chemicals Corp. of Peabody, Mass., and Roxalin of Canada, Ltd. have formed a new firm, American Resinous Chemicals of Canada,



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## BUSINESS & INDUSTRY . . . . .

**Ltd.** The new company will manufacture and sell the American Resinous coating and resin emulsions. Manufacture for Canada will be handled initially by Roxalin whose production facilities are currently being expanded at a cost of \$100,000.

### FOREIGN. . . . .

**Rubber Chemicals:** A general expansion of Canada's rubber industry has upped demand for rubber chemicals, and induced Naugatuck Chemicals Division, Dominion Rubber Co., Ltd., to start a \$400,000 expansion of its Elmira, Ontario facilities.

The expansion includes rubber chemicals now in general use, as well as some recent developments of the company. One product involved in the expansion, diphenylamine, is also used in munitions production.

**Synthetic Resins:** Latest American chemical company to establish a plant in Brazil is Reichhold Chemicals, Inc. The company has just signed an agreement with Resana S.A. Industrias, Quimicas, for the latter to produce Reichhold's complete line of synthetic resins.

The plant will be built by Resana, with Reichhold's help, near Sao Paulo. At the same time, a new company, Reichhold Chemicals do Brasil S.A., will take over sales there for Reichhold's U.S. and European plants, and also Resana.

**Sulfur from Pyrites:** Extensive deposits of pyrites have been discovered in India, in southern Bombay State. It is estimated that 10,000 tons of ore, yielding nearly 4,000 tons of sulfur, will be mined per month.

This rate will be sufficient to supply all India's internal sulfur needs, about 40,000 tons a year, which up to now have been imported from the U.S. and Japan.

**Penicillin Plant:** Spain's first penicillin plant has just been opened at Aranjuez. Backed by patent rights and technical aid from Merck & Co., the plant is starting with a proposed monthly production of 1½ million bottles containing 200,000 units. Later the company plans to double this output, also start making streptomycin.

Another Spanish company is expected to start production soon, aided by Schenley Laboratories.

**Ammonium Phosphate Fertilizer:** Preliminary construction work has begun on Consolidated Mining and Smelting

Co.'s new \$9 million fertilizer plant near Kimberley, Canada. The plant will be completed in early 1953, will produce 70,000 tons of high-analysis ammonium phosphate chemical fertilizer a year.

Construction of the actual production units will begin in the spring. These will include roasters, a gas cleaning plant, sulfuric acid plant, phosphoric acid and phosphate fertilizer plant.

**India:** As part of its war reparations from Germany, India has been allotted a complete methanol factory, a TNT factory, and a glycerine plant. The methanol plant is capable of producing 20,000 tons a year, and the TNT plant is rated at 20 tons per day. Both plants have been taken by the government.

### KEY CHANGES. . .

**George N. Brunt:** From Flintkote Co. to general manager, Southern Latex Corp.

**Ralph E. Davison:** From manager of engineering and construction, Hanford Works, Richland, Wash., to administrative assistant, engineering and production section, Knolls Atomic Power Laboratory.

**George P. Passmore:** To assistant to the vice president in charge of manufacturing, Worthington Pump and Machinery Corp.

**Robert T. Conner:** To director, research and development laboratories, Smith, Kline & French Laboratories.

**William A. James:** From senior research chemist, Standard Chemical Co., Ltd., to director of research, Dearborn Chemical Co.

**C. S. Fazel:** From director of development, nitrogen section, to vice president, Solvay Process Division, Allied Chemical & Dye Corp.

**E. D. Crittenden:** To director of development, nitrogen section, Solvay Process Division.

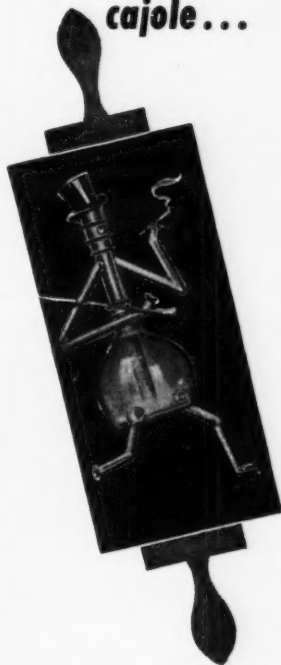
**E. W. Bowen:** To assistant director of development, nitrogen section, Solvay Process Division.

**Jerome S. Harrison:** To vice president and manager of the Chicago office, Witco Chemical Co.

**Frederick C. Wiseman:** To financial vice president, Witco Chemical Co.

**William Wishnick:** To treasurer, Witco Chemical Co.

**Chemicals**  
**that persuade...**  
**convince...**  
**cajole...**



The time and hour call for chemicals with compelling personalities... chemicals with dynamic qualities that **IMPROVE YOUR PRODUCTS...** that make them **look better, smell better, taste better.**

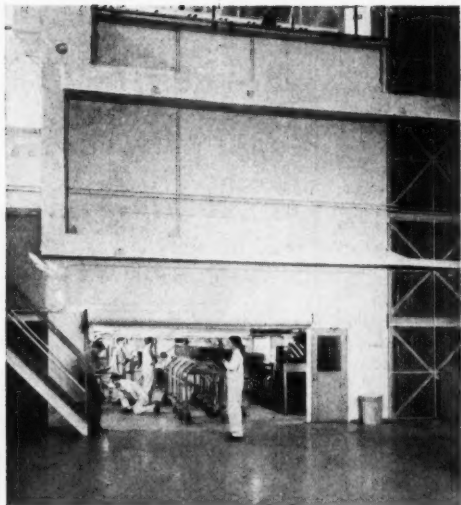
Dodge & Olcott has such chemicals and continues, as it has for the past 152 years, to develop new techniques, new materials, and excitingly new fragrances that answer the need and desire of American industry... that will evoke **popular demand** for your products. Consult D & O.



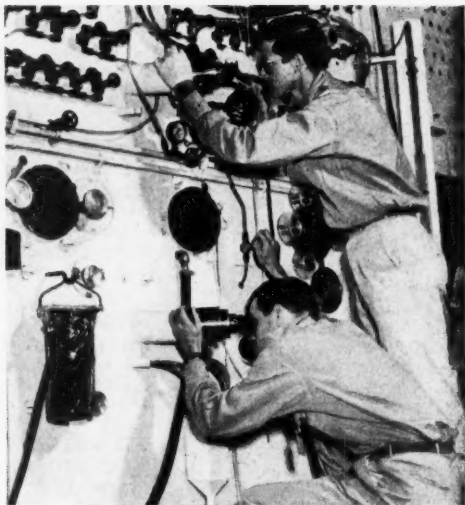
**DODGE & OLCOTT, INC.**

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ESSENTIAL OILS • AROMATIC CHEMICALS  
PERFUME BASES • VANILLA • FLAVOR BASES



**1** LONG LEAD SHIELD protects workers as "hot" isotope mixture is discharged from the huge, vault-like pile.



**2** PERISCOPES allow research chemists to observe chemical separations carried out by remote control behind wall.

## BUSINESS & INDUSTRY . . . . .

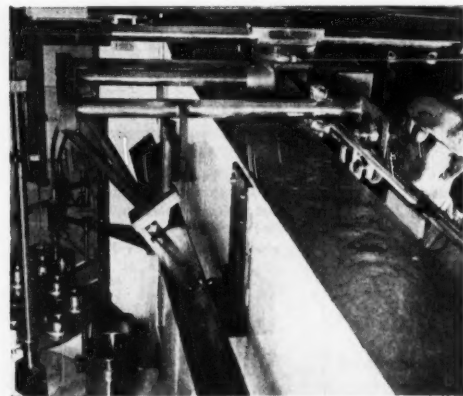
# Engineered

Like ferrets, radioactive isotopes are useful but they bite. Even relatively weak radium has for years been handled with the greatest respect; but the pile-generated radioactive materials available from Oak Ridge National Laboratory, operated for the Atomic Energy Commission by Carbide and Carbon Chemicals Co., are far more potent than their natural-occurring predecessors.

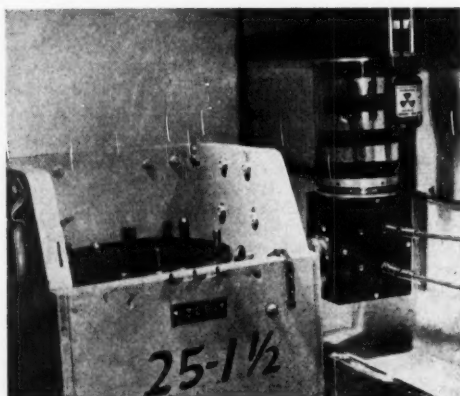
In designing equipment for producing, refining, handling and shipping these brand-new "hot atoms," Carbide had little to go on—the plant was engineered from scratch, with safety of workers the overweening consideration. Even though "bugs" might have been expected in so unknown an endeavor, Carbide has not had a single case



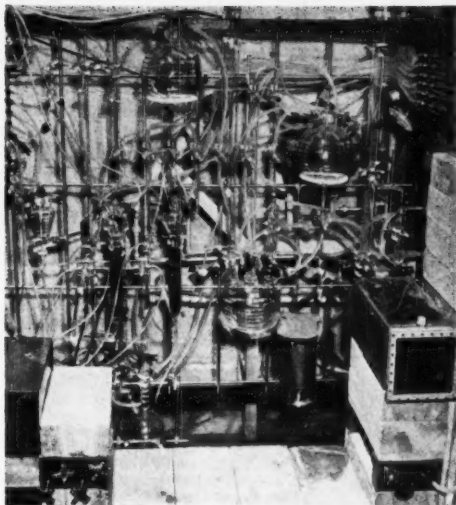
**5** REMOTE-CONTROL TONGS handle storage bottles. Note that guide numbers are reversed for observation by mirror.



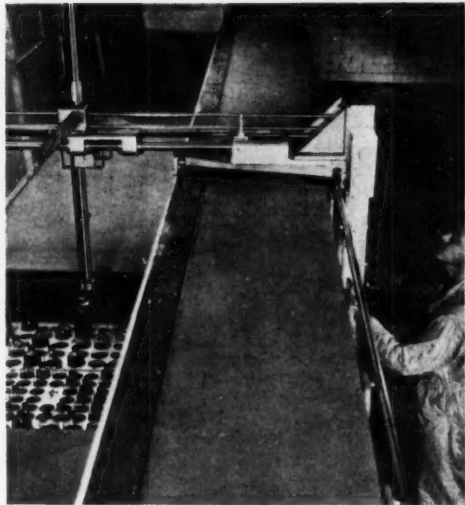
**7** FILLED SHIPPING BOTTLE is transferred by another remote-control tongs from filling section to shipping area.



**8** HERE THE BOTTLE is maneuvered into position over the lead shipping container—still behind the concrete barrier.



**3** THIS IS WHAT they see. Here Cesium 137 will be separated from other fission products of the irradiation.



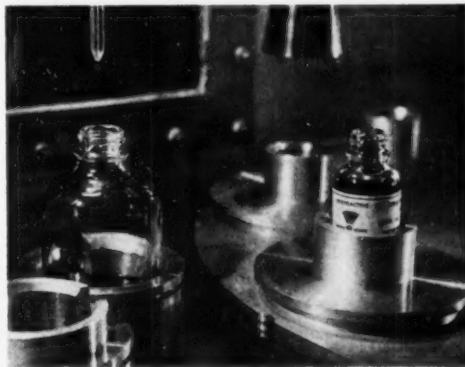
**4** PURIFIED isotope solutions are stored behind thick concrete. Sectional lids above the bottle control ventilation.

## for Isolation

of injury due to radiation during the time it has operated at Oak Ridge.

Equipment design is part of the answer, but the workers must also observe an elaborate ritual in operating it. Were it not for the radiation, the simple, straightforward steps involved in preparing a sample for shipment—getting out the large storage bottle, pipetting a measured quantity of the contents into a smaller shipping bottle, and boxing it for shipment—could all be done on a laboratory bench. It's the deadly rays that make the difference.

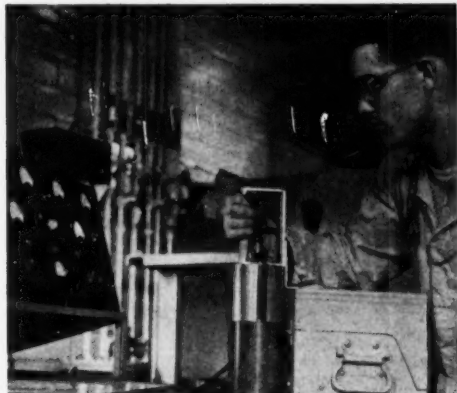
Sidelight: One of the major headaches in making these pictures was eliminating minor, stray radiation that might have fogged the film.



**6** HOLDER uncaps, holds, and recaps bottle; pipette transfers liquid to shipping bottle. Both are remotely operated.

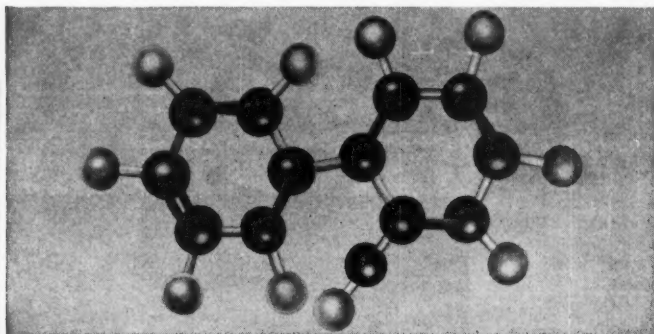


**9** A HYDRAULICALLY-OPERATED lead door permits the bottle, now shielded by the container, to be brought out.



**10** THE COVER is lowered into position. Then all six sides of the box are tested for "leaking" radiation.

## These useful Monsanto intermediates available for immediate delivery

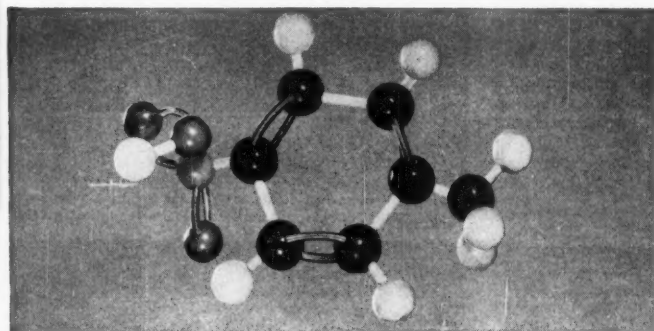


### ortho-Phenylphenol

Ortho-phenylphenol, technical, available now from Monsanto, has numerous possibilities in addition to its present uses. In this day of shortages, it may be the answer to some of your problems.

#### Typical Analysis

Appearance and Color...Light tan-white solid  
Crystallizing Point.....50.6° C.  
% Ortho P.P. (from Cryst. Pt. Curve).....95.2  
Phenol (from Cryst. Pt. Curve).....4.8  
First Drop.....277° C.  
50%.....288° C.  
Dry Point.....289° C.

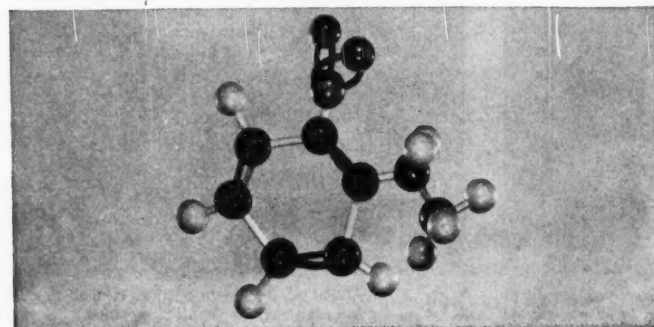


### Toluenesulfonic Acid

If you need toluenesulfonic acid, technical, get in touch with the nearest Monsanto Sales Office. Monsanto can give you prompt service on this chemical. It's used as a dyestuff intermediate and as a catalyst in certain organic reactions.

#### Typical Analysis

Appearance and Color....Greenish to black viscous liquid or semicrystalline solid  
Molecular Weight.....172.20  
Toluenesulfonic Acid.....94.0% min.  
H<sub>2</sub>SO<sub>4</sub>.....1.0% max.  
Water.....2.0% max.  
Toluene.....0.2% max.  
Para Isomer.....80.0%  
Ortho Isomer.....20.0%



### ortho-Ethylnitrobenzene

In Monsanto's available ortho-ethylnitrobenzene, you may find the solution to some of your troubles with chemical shortages.

#### Approximate Properties

Molecular Weight.....151.1  
Appearance....Yellow to green, clear liquid  
Assay.....99-100% (Including approx. 4% to 6% para isomer)  
Boiling Point.....About 228° C.  
Crystallizing Point...About -12° to -14° C.  
Refractive Index at 25° C.....1.53  
Solubility...Miscible in most organic solvents, immiscible in water.  
Specific Gravity at 25°/25° C.....1.1

## Low-cost HB-40 can help you solve plasticizer problem

Regardless of your supply situation on plasticizers, take a look at Monsanto's HB-40. HB-40 is available . . . low in price . . . an excellent coplasticizer or plasticizer extender in vinyls.

HB-40 (partially hydrogenated terphenyl) is practically colorless and, properly stabilized, performs excellent service in clear and pastel-shaded films. It is practically free of toxicity and odor.

HB-40 reduces costs without sacrificing quality when employed as a coplasticizer or as an extender for primary plasticizers in vinyl extrusions, vinyl pastes, vinyl slush moldings and in both supported and nonsupported vinyl films and sheetings. The amount of HB-40 that can be used varies from 20% to 50% based on the total weight of plasticizer in the formulation. The amount to be employed depends on the specific formulation, the type of processing and the end use of the finished vinyl plastics.

For complete technical information on Monsanto HB-40, contact the nearest Monsanto Sales Office or mail the coupon for a copy of Monsanto Technical Bulletin No. P-104.

## Monsanto expands research work in rubber chemicals

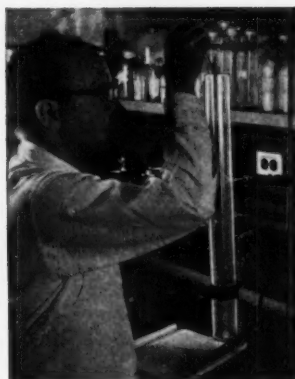
Monsanto, a leader in rubber chemicals research and manufacture for more than three decades, is expanding its laboratories at Nitro, W. Va. The new facilities will be in operation in 1952. They will almost double space available for rubber research activities. Research staff will be substantially increased to undertake new research in rubber chemistry.

Monsanto's chemicals for the rubber industry include antioxidants, accelerators, wetting agents, detergents, colors, reodorants and a number of special materials. Mail the coupon for information on Monsanto rubber chemicals and rubber laboratory service.

## Monsanto AE-1, efficient defoamer, has possibilities in many processes



Without AE-1



With AE-1

Monsanto AE-1, a new, high-molecular-weight alcohol-ester, has proved its efficiency as a defoamer. It has been used effectively in several other applications and has many unexplored possibilities. AE-1 is priced for economy and it is available in any quantities you need.

### Defoamer

As a defoamer, AE-1 is efficient and economical and is effective even at low pH ranges. It has found application as a capable defoamer in the following:

In ethyl alcohol production from molasses, 4 parts per million, added at the fermenter, controls foam.

In yeast manufacture, and in other fermentations, 50 to 500 ppm. of AE-1 ends the foam problem.

In polystyrene latex water dispersions, foam is kept in check by 0.5% to 1.5% of AE-1.

### Lubricant for Vinyls

Good lubricity for extruding or calendaring vinyls results from the addition of 2% of AE-1, based on the resin.

### Plasticizer

AE-1 is an excellent coplasticizer for rubber hydrochloride and chlorinated rubber. It is compatible with nitro cellulose and other cellulosic derivatives.

### Antiblooming Agent

Used in pentachlorophenol wood preservative formulations, AE-1 is an effective

antiblooming agent. It dissolves 25% by weight of Penta at 25° C. AE-1 increases the solubility of Penta in wood-preserving formulations.

Physical and chemical characteristics of Monsanto AE-1 indicate numerous other applications in industry. If you would like to do some exploring on the use of AE-1 in your business, mail the coupon for a copy of Monsanto Technical Bulletin No. P-140. And write for free sample for your evaluation.

\*\*\*\*\*  
MONSANTO CHEMICAL COMPANY, 1700 South Second Street, St. Louis 4, Missouri. District Sales Offices: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.



### SEND INFORMATION:

- ☐ ortho-Ethylnitrobenzene
- ☐ ortho-Phenylphenol
- ☐ Toluenesulfonic Acid
- ☐ Rubber Chemicals and Laboratory Service

### SEND LITERATURE:

- ☐ Bulletin P-104 (HB-40)
- ☐ Bulletin P-140 (AE-1)

### MONSANTO CHEMICAL COMPANY

1700 South Second Street, St. Louis 4, Missouri

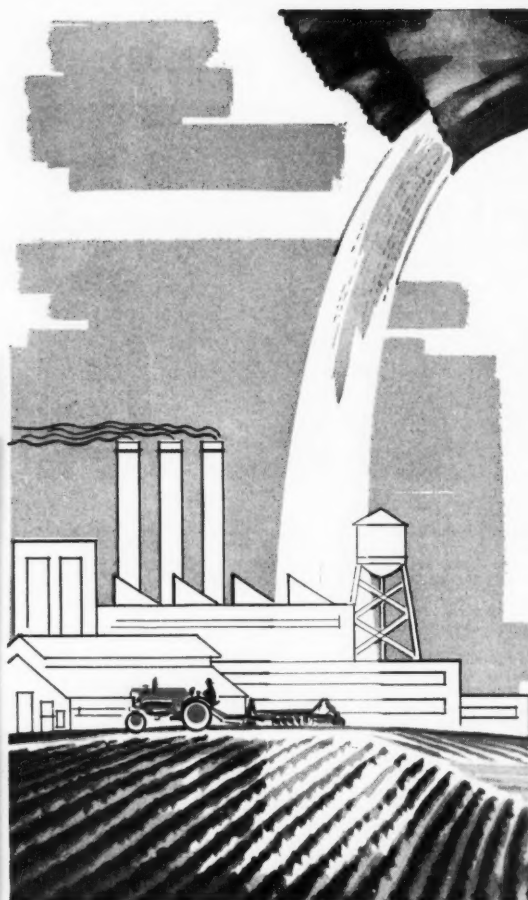
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City.....Zone.....State.....



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by  
**DUVAL**  
Sulphur and Potash Company

ANTICIPATED PRODUCTION DATE  
LATE WINTER OR EARLY SPRING, 1952.  
MORE DEFINITE INFORMATION WILL BE FURNISHED AS AVAILABLE

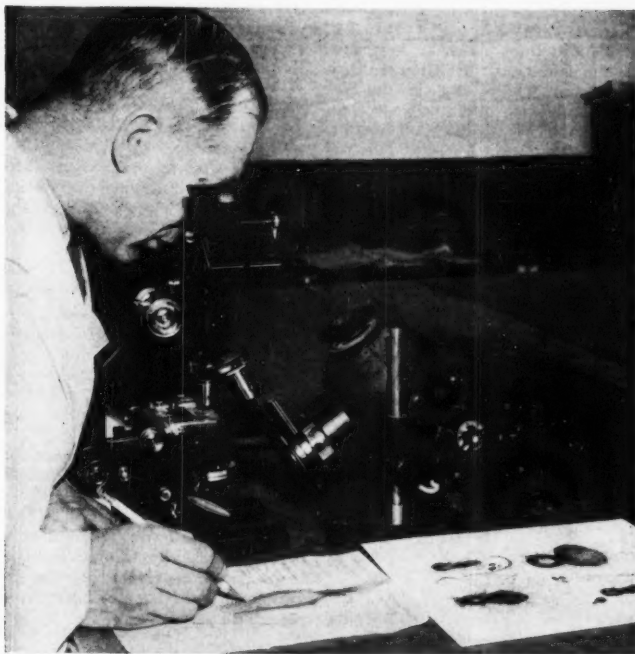
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OF FARM AND FACTORY

# RESEARCH . . . . .



ERDL's Ames: His tropical test chamber is providing data on a costly enemy.

## Military Target: Fungi

Spurred by the mobilization program, industry and government researchers are going all out to develop better fungus-proofing agents.

Synthesis and evaluation of new chemicals is a major part of current efforts; a great deal of research is also devoted to a better understanding of the damage-producing organisms.

Shortages of conventional products and special military requirements are hastening the acceptance of many new materials.

Each year the over-all cost of deterioration of materials in this country runs to about \$12 billion. Mildew, or fungus rot, accounts for a significant share of this staggering figure.

The fight on fungus has been pursued with varying zeal for a good number of years; but it took a war to bring the costly problem into sharp focus. The destruction of vast quantities of goods during World War II sold the military on the need for an active program of research to offset the menace. Efforts toward this end are shared with civilian government agencies, industrial research establishments and academic laboratories.

Much progress has been made, much more is needed.

One of the foremost fungus research centers is at the Army's Engineer Research and Development Laboratories, Fort Belvoir, Va. Under the direction of Mycologist L. M. Ames, ERDL is now testing the fungus resistance of a score of military materials. ERDL's specialty is tropical evaluation. Hundreds of samples of plastics, impregnated fabrics and cellulose-containing materials are now getting the once-over in its tropical test chamber as part of a program initiated during the second World War.

Wartime research proved highly fruitful in meeting the special problems of the military. Control of fungus growth within optical instruments was accomplished with a fifty-fifty mixture of cresatin (meta-cresyl acetate) and ethyl cellulose; a merthiolate-containing lacquer was developed for camera parts, and a highly effective preservative for photographic film developed. Other advances were made in the fungus-proofing of textiles and wood.

**Textiles First:** Most of the war-induced research on textile fungicides was centered about four major types of chemical agents: metallic naphthenates; phenolics; mercury compounds; and pure organics. But more recently another approach—chemical modification of the fiber—has shown much promise. The U. S. Department of Agriculture's Southern Research Laboratory has a technique for protecting cotton fabric by converting part of the fiber to cellulose acetate. This partial acetylation process is now in its commercial infancy.

But the search for straight preservatives isn't being neglected. The USDA's Agricultural Research Center at Beltsville, Md., is now screening more than 250 compounds in an effort to come up with a simple, effective fungus-proofer.

Although textiles occupy the limelight of fungus research, the prevention of wood-deterioration also is getting its share of attention. At Beltsville, durability studies on many types of structural woods are under way to test the efficiency of preservatives. Many of the newer ones—fluorides, chromated and ammoniated salts of zinc and copper, pentachlorophenol—are now being screened. On the basis of preliminary results, the wood preservative problem appears to be nearing solution.

**No Bed of Roses:** Not all research is successful. During World War II, researchers at the Army Chemical Warfare Service Development Laboratory of the Massachusetts Institute of Technology tried to find a suitable combination of fungicide and water repellent. Thirty-seven formulations which could be applied to standard fabrics by one- and two-bath processes were tested for resistance to attack by fungi in pure culture tests and in soil burial. Only one was found to be satisfactory.

The Air Force says there are relatively few fungicides that meet their requirements. Considerable effort is

## RESEARCH . . . . .

being made to find new compounds that are more effective than those in use.

The Air Force has a research and development program to determine the usefulness of new chemical fungicides as well as to evaluate those now in use.

According to Alton E. Prince of the Materials Laboratory of the Air Development Force, Wright-Patterson Air Force Base, a good fungicide must first of all be toxic to fungi, but not harmful to people that handle the treated material. Here's what it should not do: cause corrosion of associated metal parts; increase inflammability of the treated material; cause objectionable discoloration; or tenderize the protected materials.

Mercury compounds are excellent fungicides as far as killing power is concerned, but they are highly toxic to humans, corrosive to metals, and (because they volatilize readily) cause interferences in radio and radar equipment.

**Copper Still Tops:** A fungicide that is used in Air Force materials is the copper salt of 8-hydroxy quinoline (copper 8-quinolinolate). It is relatively heat-stable and is only very slightly soluble in water and in most common solvents. It is highly toxic to destructive fungi, but is relatively nontoxic to humans. On the debit side, it is not compatible with natural rubber and its yellow-green color is objectionable for uses where light colors are required.

The Air Force has been using this fungicide for several years in vinyl-coated, olive drab fabric. In shades other than olive drab, two other fungicides are used. They are dihydroxydichlorodiphenylmethane and the carboxylate salt of dodecyltrimethylbenzyl ammonium cyclopentane. These two fungicides are being substituted for copper 8-quinolinolate, which is in short supply. The Air Force is also using copper hydroxynaphthenate at 0.4%-by-weight metallic copper.

Mildew-proofing of the cotton tapes on slide chain fasteners used in flying clothing has presented some special problems because the fungicide used must give protection against rotting organisms, yet not interfere with the normal operation of the fastener. Air Force technicians found that brass, or corrosion-protected aluminum or zinc chains work satisfactorily when the cotton tapes contain a minimum of 0.12% by weight copper deposited as copper 8-quinolinolate.

Many of the tests being made by the Air Force are being repeated by

the Army Quartermaster Corps laboratory in Philadelphia, the Navy's laboratories and many civilian installations.

**Central Info:** To make fungus-research information available to those who could benefit from it, the National research council has set up a Prevention of Deterioration Center. Its director, Glenn A. Greathouse, nationally-known mycologist, is assisted by an advisory committee composed of scientists from industry and universities. The center acts as advisor to the defense agencies on problems of deterioration. It has a library staff to collect and index all information, and a research branch that pursues investigations on specific problems not treated adequately elsewhere.

The NRC is part of the National Academy of Sciences, the "ivory tower" of U.S. science. But Greathouse has both feet on the ground when he says, "Either we attack the problem actively and as objectively as possible in the light of latest knowledge, or we resign ourselves to inexorable decay, an attitude inimical to our age of science and invention. . . ."

**Slow Burn:** Ultraviolet transmission through sun-screening agents may now be determined by a new procedure from Food Research Laboratories, Inc. The method, based on the use of a uniform film of measurable thickness, is now a part of Army Quartermaster Corps specifications for cream and paste preparations. An adaptation is applicable to lotions.

**Another for WARF:** The Wisconsin Alumni Research Foundation—well known, among other things, for its Warfarin rat-killer—may soon commercialize cyclocumarol, a related substance. Cyclocumarol, like Warfarin, is an anticoagulant, but less drastic in its action. Intended for therapeutic use, the new product may eventually prove a serious threat to cousin dicumarol; it's two to three times as potent, more predictable per dose, faster acting and less toxic.

**Rubber Note:** Du Pont's Jackson Laboratory (Deepwater Point, N.J.) was recently the scene of some significant research on rubber stabilizers. Researchers found that nickel salts of xanthates and dithiocarbamates are valuable as stabilizers for a number of elastomers. Nickel dibutyldithiocarbamate, in particular, appreciably retarded the rate of oxygen absorption by unvulcanized GR-S and in-

creased the ozone resistance of vulcanizates.

But the commercial value of the compound is limited by its color and tendency to accelerate degradation by oxygen of natural rubber vulcanizates.

**New Quats:** Rohm & Haas Co. has recently patented (U.S. 2,541,961) several quaternary ammonium pentachlorophenates as disinfectants, bactericides and fungicides combining the bactericidal properties of the "quats" with the preservative action of pentachlorophenol.

**On the Spot:** A sensitive new spot test specific for antimony has been developed at Louisiana State University. The test is based on the extraction of the tetraiodoantimonate complex with benzene and subsequent detection with rhodamine B.

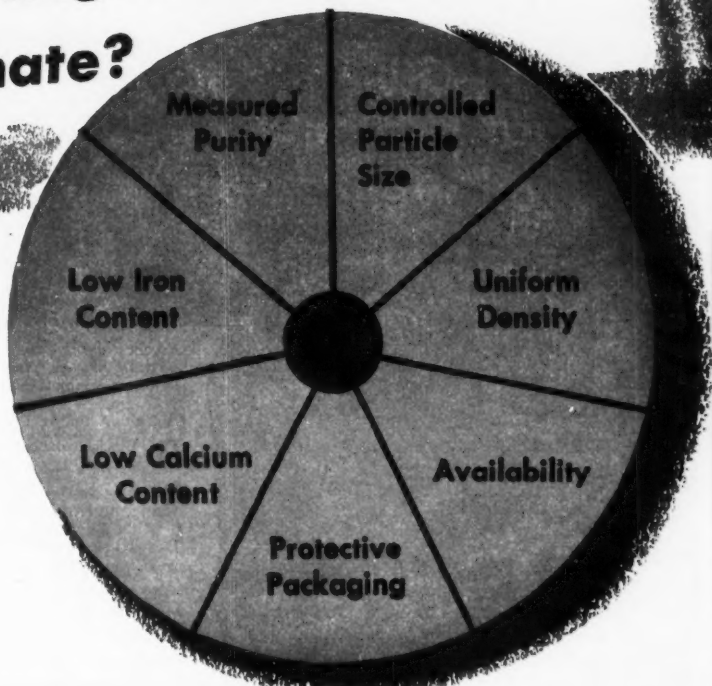
**Antibiotic Esters:** Danish researchers have prepared a number of dialkylaminoalkyl esters of penicillin which are of great clinical interest. These esters seem to have a strong affinity for the lungs and tend to accumulate in this part of the body. They also are resistant to inactivation by the enzyme penicillinase.

**Ergosterol to Cortisone:** R. H. Levin, Upjohn Co., has succeeded in converting 9(11)-dehydroergosterol to compounds of the pregnane series which might well be utilized to make cortisone. The significance of this contribution lies in the potential availability of unlimited quantities of ergosterol from yeast fermentation; the steroid also is a by-product of penicillin manufacture.

**Steroid Detection:** Researchers of Chas. Pfizer & Co., Inc., have developed a chromatographic method of separating and detecting many different steroids. Most of the steroid substances are separated on alumina-impregnated paper and developed with non-aqueous solvents. But a few slow-moving steroids are separated on plain paper by a system of partition chromatography.

A novel method of detection is used on the paper chromatograms. They are exposed to a chlorine atmosphere, sprayed with an antimony-acetic anhydride reagent, heated briefly, examined under ultra-violet light. The steroids show up as fluorescent spots or non-fluorescent colored patches according to their structures. The method is useful with as little as 0.5 microgram.

# What qualities do you want in your Magnesium Oxide and Carbonate?



**H**ow many of these qualities are vitally important to you? You get all seven—when you buy Baker's Magnesium Oxide and Carbonate.

If you react Magnesium Oxide or Magnesium Carbonate chemically, or if your final product must meet predetermined specifications, you will be interested in Baker's measured purity typified by the low iron and calcium content of these two fine chemicals.

If you formulate either of these compounds into dry or wet mixtures, the controlled particle size and density will enable you to achieve a uni-

form final product. This helps to simplify both your manufacturing and packaging problems.

Baker's protective packaging assures you that these chemicals will arrive at your point of use in good condition. Long experience in cooperating with users of Baker's Magnesium Oxide and Carbonate indicates that all seven of Baker's features are both important and essential.

So write for free testing samples and make your comparison. We will gladly quote prices. Address: J. T. Baker Chemical Co., Executive Offices, Phillipsburg, New Jersey.



**Baker Chemicals**

REAGENT • FINE • INDUSTRIAL

# DOWELL USES *Tri-Sure* CLOSURES

—to protect the  
plastics  
that protect  
oil wells



*Reconditioning a well with Dowell Plastics. Dowell always ships its plastics, plastic catalysts and oil thickening agents in drums equipped with Tri-Sure Closures.*

**D**OWELL plastics are used for reconditioning oil wells—for example, in controlling water and gas, consolidating sand, setting liners and casing, and correcting faulty cement jobs.

To perform these important functions, the plastics must reach the field in perfect condition—free from contamination of any kind. So Dowell Incorporated always ships its plastics in drums equipped with Tri-Sure Closures.\*

Where protection in transit is a *must*, you will find Tri-Sure Closures an essential part of marketing. Give your product and your prestige the security of Tri-Sure's *leak-proof and tamper-proof flange, plug and seal*. On your next drum order specify "Tri-Sure Closures".

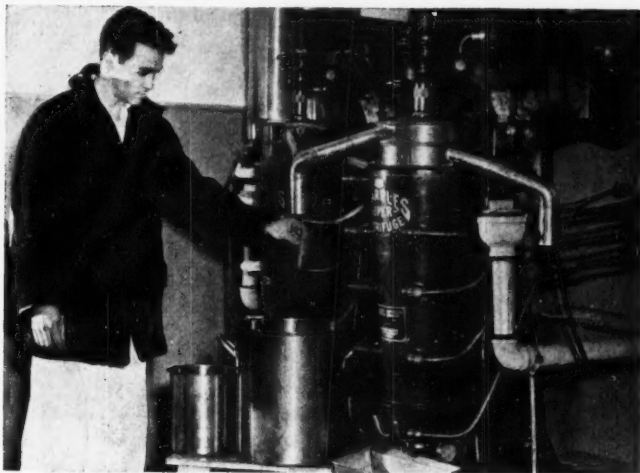
The "Tri-Sure" Trademark is a mark of reliability backed by 29 years serving industry. It tells your customers that genuine Tri-Sure Flanges (inserted with genuine Tri-Sure dies), Plugs and Seals have been used.



**CLOSURES**

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TRI-SURE PRODUCTS LIMITED, ST. CATHARINES, ONTARIO, CANADA

# PRODUCTION . . . . .



VARIDASE: High recovery of high-value enzyme is provided by centrifugation.

## New Twists in Centrifuges

New designs, new know-how have greatly extended the field of use for centrifuges.

Distinction between high-speed clarifying centrifuges and the conveyor-type are fast disappearing.

A newly introduced high-speed centrifuge ups the centrifugal force about 20%—to about 16,000 times gravity.

The field of application of centrifugal equipment continues to broaden. Recent new uses range from dewatering huge tonnages of coal fines to recovery of relatively minute quantities of the new drug Varidase (CW, Oct. 9), and all points in between.

Nearly all caustic-chlorine plants have adopted centrifugal equipment for the recovery of the last bit of caustic soda from the salt crystals that are precipitated during the concentration of the cell effluent. But something new has been added: Centrifuges now also separate the sodium sulfate impurity that is found in many brines in the Southwest. For example, a rinse of the salt with 0.70 lb. of saturated brine per lb. of salt reduces the sulfate content from 4% to less than 1%, so that the washed salt for recycling is actually purer than the fresh brine coming into the plant.

Continuous conveyor-type centrifuges\* are now being used for the classification of optical abrasives.

\* Conveyor-type centrifuges are usually horizontally mounted. The solids are moved to the discharge point by a helical conveyor rotating slightly slower than the centrifuge bowl.

By far their largest use, however, has been in the coal preparation industry. Many 54-inch machines, handling 40 tons per hour each, are dewatering cleaned fine coal; others, known in the industry as "polishers", handle the minus-48-mesh fines, after flocculation, to eliminate stream pollution and to return clear water to the plant. Some 20 million tons of fines have been "polished" to date.

A major development in continuous conveyor centrifuges has been improved feed control systems. Torque on the conveyor has been used with on-and-off control for some time to regulate the slurry feed rate. (In Shell Chemical Co.'s glycerin plant at Deer Park, Texas, the primary control of the feed rate is the liquid level in the filtrate accumulator tank with two additional control factors: feed rate is also cut down if either (1) the motor current or (2) the torque on the conveyor exceeds a safe value.)

**No Distinction:** The distinction between the slower-speed continuous conveyor-type centrifuges for dewater-

ing solids and the high-speed clarifier centrifuges is fast disappearing. Both conveyor types and the high-speed machines can handle more and different kinds of solids, while continuous conveyor centrifuges are turning at higher and higher speeds. The Bird 18-inch conveyor type often spins at 3,000 rpm, instead of 1,800 rpm as before, and the 14-inch Sharples Super-Decanter turns even faster.

Better washing devices in solid-bowl conveyor machines give as good washing with many materials as can be obtained with screen centrifugals or vacuum filters.

**Still Higher:** Sharples has introduced three new high-speed centrifuges. The new Super-Centrifuge AD-26 is especially designed for vegetable oil refining. At 15,000 rpm the centrifugal force is about 16,000 times that of gravity, 20% greater than the usual Super. Result: higher yields of vegetable oil by pulling more neutral oil out of soap stock.

The new Pressure Sealed Super Centrifuge has a sealed outlet and inlet, both at the bottom of the bowl. Its no-foam, no-aeration action makes it particularly suitable for coffee extract and apple juice.

The Sharples DV-2 is the commercial embodiment of an idea that hitherto had not proved practicable. It is a valve-discharge high-speed separator with positive external control of the valve action. Ten solids discharge valves set radially around the inside of the bowl are hydraulically operated on a controlled cycle. The time between valve openings can be varied between 0.5 and 120 seconds; the length of time the valve remains open is also controllable down to 0.3 second. This machine is finding wide use in removing pulpy matter from pineapple juice, alkaline soya liquor, and apple, prune, lemon, and orange juices.

**Batch Type:** Developments in batch centrifugals include improved baskets, drives, and controls; a vacuum wax-impregnating centrifuge; and new safety devices. Fletcher Works now supplies baskets, for use with pharmaceuticals and raw textiles, which are easily removed and easily cleaned. Hepworth Machine Co. has developed a hydraulic drive with two impulse wheels, which permits rapid safe acceleration to the high basket speeds now used in sugar processing. And Western States Machine Co. offers a number of improvements in drives

## PRODUCTION . . . . .

for sugar centrifugals, including a fluid-clutch drive, and feeding and discharging devices. Both the Hepworth and Western States control systems, which make all operations automatic except loading, have been accepted in many sugar refineries.

**Future Trend:** Nearly all the manufacturers have spent considerable sums in expanding their testing facilities to make possible more extensive tests of full-scale equipment. Bird Machine Co., for instance, recently constructed a large modern development and testing laboratory for this purpose at South Walpole, Mass. It's evident that neither brainpower nor horsepower will be spared in the further development of centrifugal equipment.

### Bamag Comes West

Formed in April of this year, General Industrial Development Corp. (New York City) is now creating a stir among chemical companies and consultant firms. As U.S. agent for Germany's construction engineering company, Bamag-Meguín, it hopes to find an American market for Bamag's European-accepted processes and know-how.

One process that is already arousing commercial interest is Bamag's modified Fauser process for making nitric acid. Briefly, the Fauser process consists of oxidizing ammonia to nitrogen dioxide, then conversion to concentrated nitric acid. Bamag's modification involves substituting oxygen for air as the oxidizing agent.

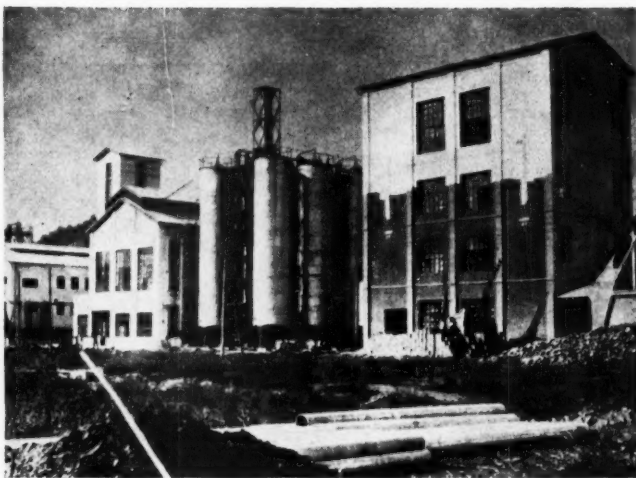
Big advantage of the Fauser process is that it permits the production of concentrated (90 to 98%) nitric acid without the customary dehydration with sulfuric acid. In addition General Industrial Development says that for a given output, use of oxygen will enable the construction of a smaller plant. That would mean lower operating costs as well as smaller initial investment.

The catch is that the producer would have to have his own oxygen plant. And American experts point out that the process would entail extensive refrigeration facilities, also think corrosion might pose a problem.

**Sweet and Fresh:** Other processes that General Industrial hopes to sell in this country:

- A modified Claus process for recovering sulfur from sour gas. (Bamag built the recovery system for Iran's Abadan refinery.)

- A polymerization process for fish oils. The process is claimed to remove the taste and odor of train oils, make them suitable for use in foods.



**BAMAG NITRIC PLANT:** You need an oxygen plant too.

Furthermore, the oil will remain "fresh" for three years. Presently, oil produced by the process is substituting for olive oil in preserving Norwegian sardines.

- A process for recovering sulfuric acid from pickling liquors. Two steps are employed: first, formation of a ferrous sulfate hydrate; then conversion to sulfuric acid. Although the same process has been tried in this country, General Industrial Development thinks that Bamag's thirty years of European experience will make a difference.

The company also plans more extensive installations of Bamag Wecker plants for distillation of fatty acids, and Bamag equipment for electrolysis of water. Two Wecker plants are now in operation in the U.S., and according to General Industrial Development, both customers are thinking of more.

Bamag electrolyzing equipment is also used by two customers here. And although electrolytic hydrogen is not used extensively in the U.S., the high-purity product may make it increasingly attractive.

**From Scratch:** Like the rest of German industry, Bamag was hard hit by World War II. It had to start from scratch in rebuilding. In fact, things looked so dark at one time that management was debating the advisability of resuming operations at all. Now, however, the company is operating at 80% of prewar capacity. It has four plants (prior to the war it had six, two were taken over—and dismantled—by the Russians) and a staff of 700 engineers.

General Industrial Development is headed up by Fred Laurent.\* The Company will either put up the whole plant or charge an engineering fee in exchange for its know-how. In any case, the big difference in economies makes cost comparisons between American and European plants difficult. General Industrial Development will figure raw material and power requirements, man-hours necessary for the job. The customer can then make his own cost estimates.

### Teflon Only

A new wrinkle in the chemical process field is just being introduced in Philadelphia. A new company, Mic-Lin, will specialize in the manufacture of Teflon parts, and nothing else. Although the company is less than a month old, Ed Walsh, who heads the venture, can already point to significant successes.

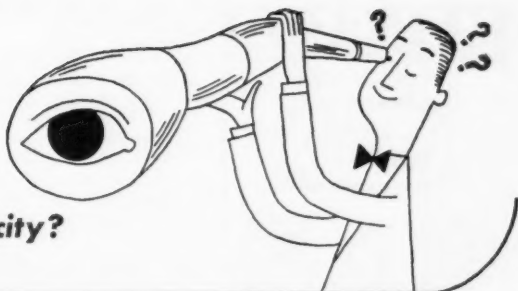
The company is concentrating on working to close tolerances, meeting special requirements, and doing a general job of "custom-engineering." But they are not neglecting the more routine work that has made Teflon an invaluable material in the chemical industry.

The newly-found company feels that Teflon, with its extreme inertness to chemicals, its heat resistance and remarkable electrical properties, is going to find more than enough uses to warrant this concentration.

Under the slogan that "no job is

\* Longtime Bamag representative in France, special consultant to the U.S. War Department during World War II.

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## PRODUCTION . . . . .

too tough", Mic-Lin is already delivering "snorkel" valves for submarines, and many other special parts. Recently, Walsh claims, the company beat its first problem job, the sealing of a Teflon tube on both ends—by mechanical means. All other means had failed to do the job, he says, and it bodes well for the fledgling company and its highly concentrated field of operation.

### New Reform "Cat"

Standard Oil Co. of Ohio (Sohio) is the latest to come up with a catalytic reforming method. An alumina-chromia catalyst is the heart of the process which will be installed by Sohio at three of its refineries: Cleveland, Lima and Toledo, Ohio.

Universal Oil Products Co. and Atlantic Refining Co. have already developed processes based on use of a platinum catalyst, while M. W. Kellogg Co. is pushing one which utilizes molybdenum oxide. Houdry Process Co. has still a fourth method.

In catalytic reforming the octane number of a gasoline is upped both by isomerization of the paraffin hydrocarbons and production of aromatic hydrocarbons by dehydrogenation of naphthenes. When operating on a high-naphthene crude stock, reforming of the proper fraction is the basis for the manufacture of petroleum-derived benzene and toluene.

**Socony Too:** Sohio will not be the only company to utilize its new process. About eighteen months ago the thirty patents which it had taken out under the direction of E. C. Hughes, Sohio chemical research chief, were sold to Socony-Vacuum Oil Co. on a cash and royalty basis. But Sohio retains the right to use the process in its refineries without royalty.

At present Socony operates a 50 barrel-a-day pilot plant at Pausboro, N. J., laboratories and is expected to erect three units at its refineries in the near future.

**Lower Pressure:** According to Hughes, the outstanding advantage of the new method is its ability to operate at 50%-80% lower pressures than competing processes with the attendant saving in first cost.

## EQUIPMENT . . . . .

**Heating Tape:** A new flexible heating tape is being marketed by the Scientific Glass Apparatus Co. Consisting of resistance wire covered with a double sheath of fiber glass yarn, the tape is suitable for heating small glass

vessels of any shape. Because its construction involves the use of a large amount of wire in a relatively small area, it produces high wattages without excessive heating of the wire. The tape can operate on either 110 or 220 volts; constant temperature can be attained by use of a voltage regulator.

**High Pressure Pump:** Kobe Inc. (Huntington Park, Calif.) is now introducing its high-pressure triplex pump for use as a heavy-duty packaged generator for hydraulic power systems.

Available in 15, 30 or 50 hp size, the pump carries pressure ratings as high as 5,000 psi, displacement ratings up to 60 gpm. More than 1,000 of the pumps are now in use by a unique hydraulic oil well pumping system for which it was originally designed. The pump's versatility has led Kobe to believe it will prove useful for other applications, and the company is establishing a sales and service organization to develop more extensive markets.

**Experimental Motor:** Developed for the military and for special industrial applications, a new synchronous motor is being offered to equipment designers on an experimental basis by Allis-Chalmers Mfg. Co. (Milwaukee). The motor operates on the reluctance principle, has no brushes, slip rings, rotating coils or permanent magnet. Advantages claimed for the motor: high shock resistance, minimum maintenance. A-C is aiming distribution at designers of control systems, military and industrial equipment.

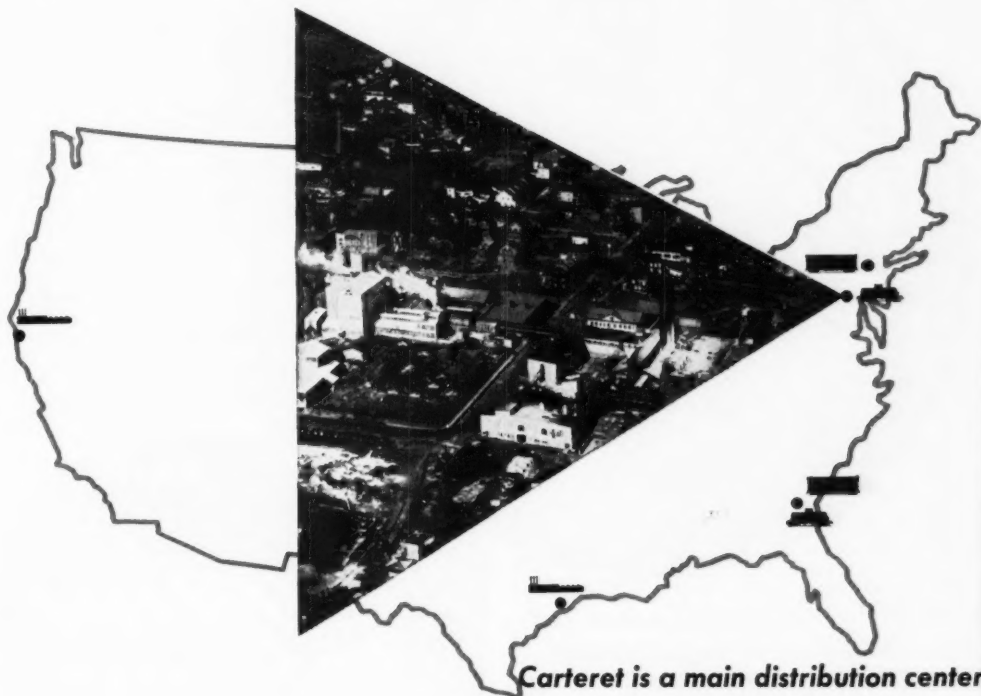
**Radiation Probe:** A new lightweight radiation probe for detecting and measuring alpha, beta, gamma, and neutron radiations is being marketed by General Electric's Special Products Division.

Designed for use in hospitals as well as industrial and research laboratories, the new probe weighs only 10 lbs.

**Vacuum Pumps:** A new small vacuum pump, specially designed for laboratory projects, industrial installations, and refrigeration service applications is a product of the Kinney Manufacturing Co.

The new pump has a free air displacement of 2 cu. ft. per minute, and is 14 in. long, 10 in. wide, and 13 in. high. On blank tests the pump produced McLeod Gauge absolute pressure readings of 0.2 micron or better.

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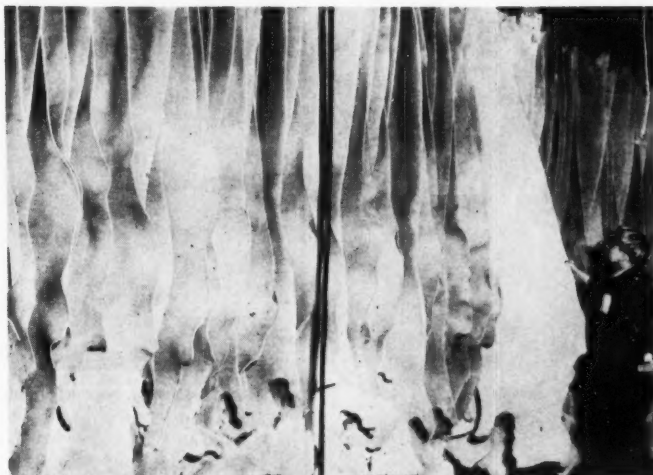
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# SPECIALTIES . . . . .



SYNTHETIC-TANNED HIDES: Uniformity and better quality.

## Synthetic Tans Toe In

Vegetable tannages, higher in price and shorter in supply, are getting new competition from synthetic tanning compounds.

Advantages of synthetics: better supply, standardization, custom formulation for specific properties in finished leather.

Faced with an impending shortage and a steady upward trend in the prices of natural tanning materials, leather tanners are giving more and more attention to synthetic replacements.

Almost all supplies of the two main types of natural tannages—vegetable and chrome extracts—are imported. The need for domestically produced compounds for wartime use has also been a spur to development of synthetic tanning chemicals.

Chemically, tanning compounds known as syntans are condensation products of sulfonated phenols (or its higher homologs) and formaldehyde. Other compounds used to assist in tanning include a number of resin types. Normally, these are used in conjunction with mineral tannages such as those derived from chrome ore.

Tanning chemicals, whether designed to replace the natural pyrogallol- or pyrocatechol-containing extracts, or just to assist them, bring many advantages the natural materials don't have. Main among these is standardization: Natural materials will vary, while synthetics, subjected to production quality control, do not.

Second advantage: Synthetics can be tailor-made for a specific task, while natural materials can have their properties changed only by blending various extracts.

**Companies In Field:** Principal manufacturer in the field is Rohm & Haas. Despite the fact that in the chemical field, R&H is better known for its work in plastics, it had its beginning in supplying leather chemicals.\*

The company's Leukanols and Tamol (a neutral Leukanol derivative) are used as tanning assists, improving the standardizing results of vegetable tannages. Orotan TV, on the other hand, can be used alone as a complete replacement of vegetable materials. Resins also account for part of its tanning material sales.

American Cyanamid's Tanak series includes assists, complete tannages and resins. Du Pont has entered the field of resin fillers with its G-942, a copolymer of maleic anhydride and styrene. Smaller producers in the field include Jacques Wolf (Tanasol) and Arkansas Co. (Arkotan).

\* First product: enzymes for removing hair from hides, thus putting collectors of Palestinian dog excrement (which contains similar enzymes) out of business.

Barely more than three years old, Chemtan Corp., of Port Washington, N.Y., is the brainchild of five former Cyanamid researchers. In this short period of time, they have already developed yearly sales running into seven figures.

Their main developments are in the resin field, working with amine-formaldehyde condensates. One of their resins is designed for use as filler, following chrome tannage; a second, which combines resin and iron salts, can be used by itself.

**Germans Started It:** First use of any synthetic tanning material on a wide scale came in Germany. During the second World War, the nation was forced to rely on synthetics previously developed in the laboratory. Most of the work done in this country began with compounds similar to the German production.

Germany's postwar experiences point up the superiority of synthetics. When the war ended and imports of vegetable tannages could be resumed, the German tanneries were hungry for this luxury. Currently the Germans are dropping the vegetable materials in favor of their old syntans. Reasons: available chemicals, better process control, uniform results.

One German advantage not present in this country is the relatively greater phenol and coal-tar compound supply. U.S. production of aryl-based synthetics feels the pinch on the amounts of these available for such uses.

**Competition for Leather:** Persons who think that the field of leather chemicals is a limited one because synthetic materials will replace leather itself are probably wishful thinkers. Prices of hides—since they're by-products of meat production—could go down to almost nothing. No plastic with leather-like properties is available which could be produced at give-away prices.

**Outlook for Future:** While production of synthetic tanning agents and assists doesn't come anywhere near vegetable tannages in volume, use of synthetics is increasing, especially for use in conjunction with the vegetable materials.

The opinion of Chemtan partner Rolf Quarck probably echoes those of other suppliers in the field. Says he: "It's a big field, and within five or ten years, companies who haven't wanted to fool with leather chemicals will wake up and ask themselves why the hell they're not in on it."

# Tall Tale

Speaking of smoke, you should have seen Paul Bunyan's hot-cake griddle in action at daybreak along the Little Gimlet. Griddle was so big you couldn't see across it on a misty morning. Took two cement mixers to stir the batter and half a dozen men skating around on slabs of bacon-fat to keep the pancakes from sticking.



# to Fabulous Fact

In the smoky days before silicones, thousands of bakers worked all day at greasing machines to keep our daily quota of 30 million loaves of bread from sticking to the pans. Kept a few thousand more men busy scrubbing grease stained floors and uniforms; cleaning the smoke stained walls and ceilings; scraping carbonized grease from the pans. Now progressive bakeries use DC Pan Glaze, a Dow Corning Silicone coating that keeps bread from sticking for at least 100 bakes per application. It never gives off smoke or leaves a charred residue; never wipes off on uniforms; never turns rancid. It sets new standards for quality and cleanliness. Here, as in most industries *Dow Corning*

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## SPECIALTIES . . . .



POWDER BLEACH: National push for a new product.

## Bleach Blitz

Du Pont survey shows promising outlook for perborate bleaches. And at least one producer thinks the future is rosy, too, for he is launching national promotion for his powder bleach.

The product just going national is "snowy," made by Gold Seal Co., Bismarck, N.D. The company's merchandising-wise president, Hal Schaffer, is out to make the American housewife aware of the new safety bleach in the same manner he brought the wonders of Glass Wax to her attention several years ago.

This latest attack on the purse strings of homemakers has double interest for specialties producers: They will be eager to see whether Schaffer can repeat his Glass Wax success after two less spectacular efforts (with furniture cream and floor polish); and they may get some idea of how deeply powder bleach can cut into liquid hypochlorite sales (CIW, April 14).

Object of Gold Seal's campaign, of course, is to put "snowy" in the number one sales spot. It has been test-marketed for about a year, and the company thinks it knows what the basic selling appeals for the product are. Emphasis will be placed on its safety in bleaching nylon, rayon, silk and wool—all formerly considered unbleachable—and on "kindness" to skin.

Looks Good: Du Pont, which has no direct connection with any of the formulated powder bleaches\* on the market, is interested in them as outlets for sodium perborate. This is the active ingredient which breaks down

\* Among the many brands are Vano, Safety Bleach, Dexcel, Duo-White.

## SPECIALTIES . . . .

into hydrogen peroxide in water. In addition, the formulations commonly contain a water softener such as sodium tripolyphosphate for effective action in hard-water areas.

The company had a market survey made in the Toledo area to determine whether the housewife wants and needs a powder bleach, and if so, whether it would replace the commonly-used liquid sodium hypochlorite bleach, or whether it would be used in addition to the liquid bleach. The survey indicated that most housewives would use the new product mostly as a replacement.

Du Pont thinks that the future for perborate bleaches is promising, that greater distribution of such products would be accompanied by a pick-up in sales. (Not more than 25% of the country has yet had an opportunity to buy such a product, and probably less than 15% has had a good chance to try it, reports the company.)

Schafer aims to change these percentages drastically. Contrary to the Du Pont survey, however, he doesn't think his product is strictly competitive with liquid bleaches. He says that 80% of "snowy" users use liquid too; the other 20%, he believes, is composed of newcomers to the bleach market. But whether it's a complementary or a complete bleach, he's going to make sure that every woman has heard of it, seen it and tried it.

## Dandruff Doser

Selenium sulfide suspended in a detergent is the active principle in a new dandruff preparation marketed last week by Abbott Laboratories under the name "Selsun."

Selsun, available only on prescription, has controlled dandruff in 92 to 95% of the cases tested. Control of infection lasts one to four weeks.

The compound's medical efficacy was first discovered by General Electric, which developed it back in 1928 during research to find a mercury vapor detector for laboratory use. GE produced it on small scale for its own workers' use, but in 1943, when demand got too big, turned it over to Battelle Institute for testing. Here toxicological studies were carried out, demonstrating that it is not toxic externally. Internally, it is toxic; hence its availability only on prescription. Abbott took over final development and research activities early in 1950.

## Teeth Bomber

A new toothpaste is being pushed toward final development in Procter & Gamble laboratories, and the company soon may reenter the dentifrice derby with the compound—a paste

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## SPECIALTIES . . . .

which will froth, releasing oxygen. Selling point: Oxygen will dislodge food particles from between the teeth. Only thing bothering researchers is how to get a peppermint flavor and oxygen source that are compatible.\*

Foaming isn't the only thing new in dentifrice field. Pepsodent's new chlorophyll-containing Chlorodent is starting national distribution this week. Advantages claimed: reduction of acids in mouth; deodorization.

Test marketing in four cities brought sales described as "almost phenomenal."

**New Distribution Point:** Parke, Davis Co. has begun construction of a \$100,000 warehouse in Menands, N.Y., near Albany. The building will be used for distribution for northern New York State and New England.

**Writing Surface Paint:** Sapolin Paints, Inc., has introduced a new paint which gives a dull green finish suitable for use as a chalk writing surface. One coat is all that is needed except for exceptionally porous surfaces.

**Porcelain-Type Enamel:** High weather-and abrasion-resistance are the selling points for Porcelain-amel, as United Lacquer (Linden, N.J.) terms its new finish. Developed for a neon sign manufacturer, it can also be used in other outdoor installations where sour gas and similar substances are present.

**Anti-Rust Paint:** Monroe Co., Inc., has introduced a new anti-rust paint which can be applied over rust without wire-brushing, scraping or sand-blasting. Marketed under the name Rust-Cure, it is available for finish applications in black or aluminum, and in clear for undercoating.

**Acrylic Cements:** Three new cements for acrylic materials—CD 2, 94 and 114—have been developed by Chemical Development Corp. (Danvers, Mass.). These are monomer-base cements; hence are said to produce bonds of greater strength and better appearance than solvents alone. CD 2 was developed for Plexiglas; 94 and 114 for Lucite.

**Bright Zinc:** Use of a new bright zinc process, BSZ-300—a development of Hanson-Van Winkle Munning (Matawan, N.J.)—is claimed by the maker to produce bright to brilliant

\* Also to be marketed in next few months: oxygen-releasing cosmetic creams. However, since these creams must be packaged in tubes, re-education of jar-using women will be necessary.

## SPECIALTIES . . . .

deposits directly from the plating bath simply and economically. It is based on use of BSZ-300 as an additive to the regular cyanide solution; requires no special equipment.

**Pitch Coating:** Tarlac is the trade name of a new protective coating for such surfaces as concrete, metals exposed to corrosive elements, mastic floors, and wood exposed to the elements that has been introduced by Flash-Stone Co. (Philadelphia). A stable suspension, it is unique in that although it is compounded from coal tar pitch and has all of its advantageous properties, it is fast drying.

**Dusting Termed "Menace":** Central Arizona residents have complained to the Civil Aeronautics Authority concerning crop dusting in mixed farm-residential areas. A Phoenix doctor reported that dusting apparently induced mass bronchitis in South Phoenix in an area near a recently dusted cotton field. Arizona Health Department director, Dr. J. P. Ward, has asked CAA to formulate stricter controls. Doctors in the area have termed crop dusting a "health menace."

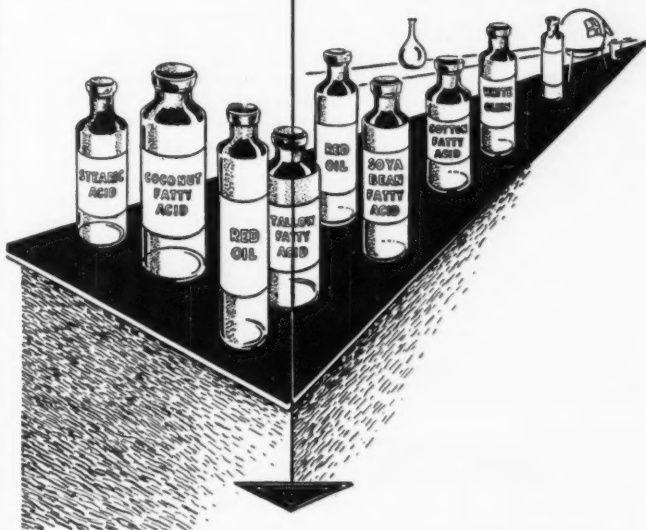
**Metalworking Chemical:** American Cyanamid Co. this week introduced a new addition agent for use during cold drawing, porcelain enameling and tin plating. In pickling solutions, the agent, which carries the trade name Aerobrite, results in brighter steel and the removal of surface iron salts harmful to expensive dies. In nickel plating, the compound can replace sodium cyanide in removing iron salts. Advantages here include cheapness and less toxicity than the cyanide.

**Nylon Dye Aid:** Richmond Oil, Soap & Chemical Co., Philadelphia, has introduced a non-ionic paste compound, Nylperse, for use in dye baths. The compound is suggested for use to effect a better union of dyes in 15-denier nylon stockings between multifilament and monofilament nylon yarns. The multifilament yarns are used in heels, toes and welts.

**Skin Ointment:** Sharp & Dohme, Philadelphia, has developed a new ointment containing bacitracin and tyrothricin for treatment of pyogenic skin infections. Both of the antibiotic agents are particularly effective against gram-positive organisms, and in combination act more effectively than when applied alone. Trade name of the compound is Tyrotrace.

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<b>Acid Value</b>	195 — 198
<b>% F.F.A.</b>	
as Oleic Acid	98 — 99.5
<b>Iodine Value</b>	
(Wijs)	91 — 95

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# PACKAGING

## Container Crux

Decided improvement in the supply situation for some packaging components during the second quarter was no mirage. NPA's just-out survey confirms it. There was no improvement, however, in the supply of either barrels or bags.

The survey shows that shipments of metal cans were up 14.5% over the first quarter of this year, 3.5% over the second quarter of last year. In general, food items took the lion's share of the additional production, but chemicals showed some gains too.

Fabricators of glass containers continued to produce at a record-breaking clip but still below capacity. Even though the scarcity of steel has placed an extra burden on glass packages, the industry has been confident that it can meet all demands "on a reasonable basis." In view of the first-half production (over 60 million gross) it looks as though the industry will exceed the predicted production of 120 million gross, and there is no reason to expect a shortage in glass containers.

**Barrels and Bags:** The supply picture for metal drums continued dark through the first half of the year. Handicapped by lack of sufficient steel, the industry was able to produce at only 50% to 55% of capacity. Demands were heavy, and the net result was a 2.9% increase in unfilled orders over the first quarter. NPA predicts little help for drum makers through CMP, but says its drum order, M-75, will result in a better distribution of the available supply.

Partly as a result of the shortage of steel drums, chemical men were relying more heavily than ever on the fibre type. In spite of that, manufacturers report that demand was down from the first quarter and they were able to replenish their dwindling inventories. This slackening in demand was probably seasonal, however, and demand will pick up again before the end of the year.

Production of paper shipping sacks—important to the chemical industry which takes almost a third of the total output—was up, demand also increased. A general lack of kraft paper held up deliveries, and bag makers generally report low inventory. On the bright side: NPA predicts that total production of paper shipping sacks in 1951 will be between 20% and 25% higher than last year.

Gas cylinders were also in short supply as a result of the steel shortage. Heavy demand continued from the first quarter, and all indications are

that it will continue for the remainder of the year. By June, producers of high-pressure cylinders reported they had been sold out for the rest of this year, were even then scheduling deliveries for the early part of 1952.

**Optimistic?** NPA's report on packaging materials is definitely encouraging, but may be slightly optimistic. For instance, it says that during the second quarter, there "was a softening of demand for practically all type containers with the exception of glass, metal and certain type paper materials and plastic packaging materials." That is a mighty big "exception."

Actually, the chemical industry—along with others—has learned to live with the container shortage to a large extent. Programs to standardize, conserve, and re-use have been a big factor. Increased production is always the best bet for licking a shortage. Taken together, they have contributed to a general improvement in the outlook for packaging materials. But new capacity is continually coming in, demand will continue to mount and container manufacturers will be hard pressed to keep pace. Industry's opinion is that the supply of containers is on the upturn—but it will be tight for some time to come.



## Control With Dispatch

**MATERIALS HANDLING** has been stepped up at Timken Roller Bearing's plant in Canton (Ohio) since the company installed Motorola F. M. two-way radios. The dispatcher looks out the window and directs a straddle truck. He also controls 23 other vehicles engaged in materials handling operations around the plant.

## BOOKS .....

**Fundamentals of Semimicro Qualitative Analysis**, revised edition by Erwin B. Kelsey and Harold G. Dietrich. The Macmillan Co., New York, N.Y.; viii+328 pp., \$4.

With a view to saving time and materials, this volume presents the theory and practice of qualitative analysis in terms of semimicro procedures. The first section of the book reviews fundamental theories of qualitative analysis with reference to some specific illustrations of their application. In the following section, each analytical group is outlined, and accompanied by brief discussions on the application of theory to the precipitation of that group and to the systematic identification of each ion of the group, thereby coordinating theory and practice. Problems and exercises are presented at the end of each chapter.

**Modern Pyrometry**, by Charles H. Campbell, Chemical Publishing Co., Inc., New York, N.Y.; 155 pp., \$4.

Indicating the industrial importance of the measurement and control of temperature, the author discusses principles of pyrometry and new developments along this line. Groups of pyrometric systems are selected and described so as to give a representative picture of techniques and equipment used in temperature control work. Covered here are various types of thermocouples, lead wire, protection tubes, indicators, recorders, and controllers in addition to information given on the care and maintenance of pyrometers.

### BRIEFLY LISTED. .

**1951 REVIEW OF CURRENT RESEARCH AND DIRECTORY OF MEMBER INSTITUTIONS**, 250-page guide to engineering college research lists 5,200 research projects in 91 American colleges and universities; administrative officers, policies, personnel, expenditures, and titles of projects are outlined for each institution. Engineering College Research Council, Room 7-204, 77 Massachusetts Ave., Cambridge, Mass., \$2.25.

**DIRECTORY OF STEEL FOUNDRIES**, 208-page directory for 1951 listing data on steel foundries in the United States, Canada and Mexico; informational breakdowns are included on personnel, production equipment, types of castings produced, capacities, trademarks and related data. Compiled and published by Steel Founders' Society of America, \$10 per copy.

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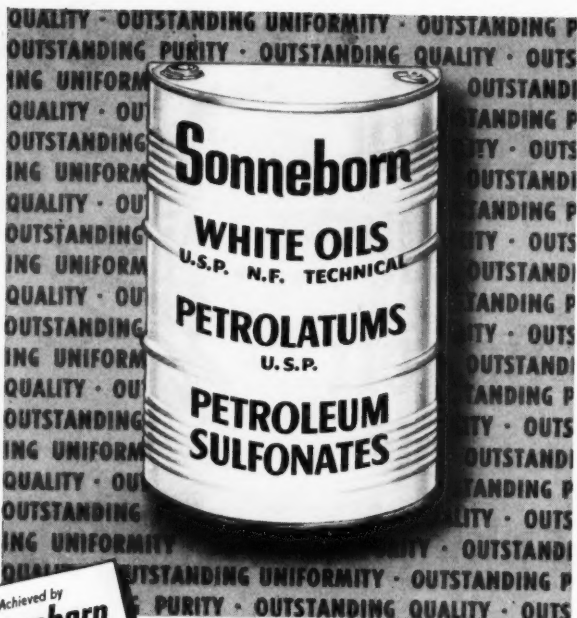
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## BOOKS . . . . .

which hinge upon vacuum research and engineering. Published by W. Edwards & Co., Worsley Bridge Road, Lower Sydenham, London, S.E. 26, England, \$4.20 per annum.

**INDUSTRIAL PLANT LOCATION, ITS APPLICATION TO ZINC SMELTING**, by Carl Hayden Cotterill, 155-page study which seeks primarily to demonstrate, by means of the zinc industry, the factors to be taken into consideration in determining the regional location of industrial plants; the zinc and zinc smelting industries are thereby reported on from the various viewpoints of technology, business and geography. Available from the author, Carl H. Cotterill, 1600 Brown Bldg., St. Louis, Mo., \$5.

**DIRECTORY OF PACKAGING MACHINERY MANUFACTURERS**, loose-leaf type volume containing two sections: the first lists all types of packaging machinery along with their manufacturers; the second section presents names and addresses of manufacturers, alphabetically, with additional data on the machines each produces. Packaging Machinery Manufacturers Institute, 342 Madison Ave., New York, N.Y., \$10.

**OSAKA TRADE INDEX 1951**, contains information on approximately 1,000 exporters, importers and manufacturers in Osaka, along with their products. Published by Osaka Foreign Trade Institute, Hommachi-bashi, Osaka, Japan.

## MEETINGS . .

**Packaging Inst.**, annual forum, Commodore Hotel, New York, N.Y., October 22-24.

**Assn. of Cons. Chems. & Chem. Engrs.**, annual meeting, Shelburne Hotel, New York, N.Y., October 23.

**Natl. Paint, Varnish & Lacquer Assn.**, Chalfonte-Haddon Hall, Atlantic City, N.J., October 29-31.

**Natl. Pest Control Assn.**, annual meeting, Statler Hotel, Boston, Mass., October 29-31.

**Paint Industries Show**, annual FPVPC meeting, Chalfonte-Haddon Hall, Atlantic City, N.J., November 1-3.

**Amer. Petroleum Inst.**, annual meeting, Stevens Hotel & Palmer House, Chicago, Ill., November 5-8.

**Amer. Drug Mfrs. Assn.**, Waldorf-Astoria Hotel, New York, N.Y., November 8-9.

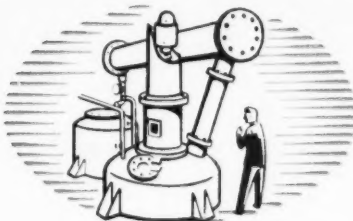
**Amer. Council of Com. Labs.**, Baker Hotel, Dallas, Tex., November 15-16.

**Exposition of Chemical Industries**, Grand Central Palace, New York, N.Y., November 26-December 1.

### PICTURES IN THIS ISSUE:

Cover (center)—Reni Photos; Cover (bottom)—Lederle Lab. Div.; p. 13—(right)—Harris & Ewing Photos; pp. 20-21—J. E. Westcott—Atomic Energy Commission; p. 25—Corps of Engineers, U. S. Army; p. 29—Lederle Lab. Div.; p. 36—Lyn Crawford—McGraw-Hill.

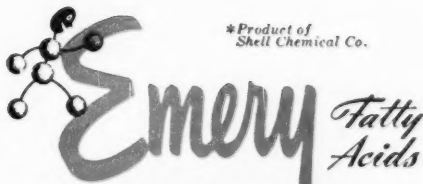
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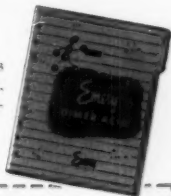
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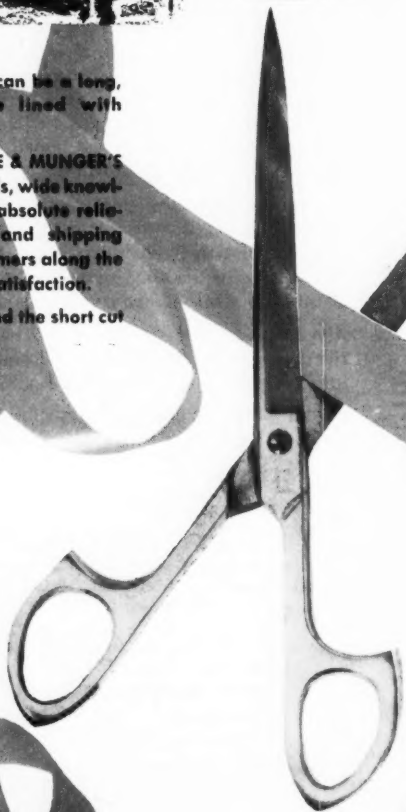
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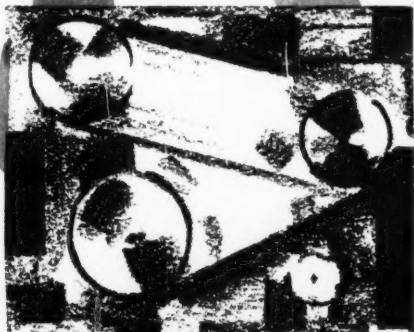
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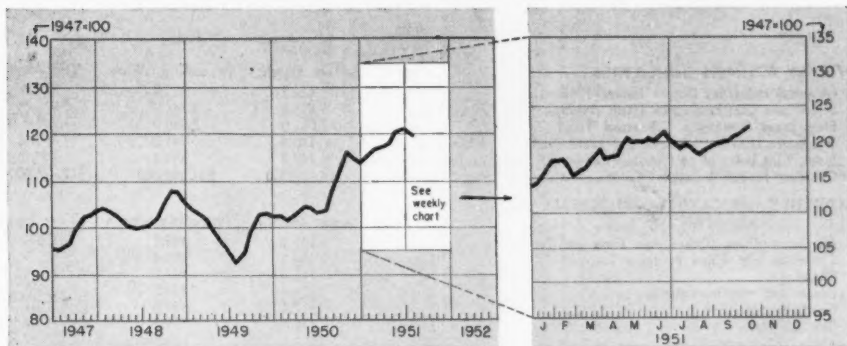


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# CHEMICAL MARKETS....



CW Index of Chemical Output—Basis: Total Man-Hours Worked in Selected Chemical Industries

Until now, industrial mobilization for defense has been largely limited to tooling up. Henceforth, more products are slated to flow from the process industries, and with this greater output will come a heavier demand for chemicals.

Chemical demand for civilian industry has been holding up well since fall began, particularly at the retail level. Inflated inventories, a netting problem since the over-buying spree early this year, are gradually shrinking to normal size. Now, if civilian needs start to climb, supplies won't go around. Reason: Pentagon's needs come first.

Defense Mobilization Chief Charles Wilson warns of a possible trend toward inflation. A smaller supply for civilian industry coupled with rising demand usually applies pressure in that direction. But it isn't likely to happen to any extent to the chemical industry. New production in 1952 will help keep prices near today's levels.

The Office of Price Stabilization will try to push its hotly contested substitute for the Capehart amendment through Congress. The new proposal has already passed the Senate Banking Committee by a 15-7 vote. But as a weary Congress drags toward adjournment, price legislation may be deferred for quite a while.

In the interim, many chemical manufacturers privately wonder if the possible benefit of filing under CPR-22 is worth the effort. Five producers of polyvinyl chloride decided not. After figuring both ways, this quintet received OPS permission to remain under the General Ceiling Price Regulation of last January. The ruling applies to all polymers containing at least 50% polyvinyl chloride.

Last year some 315 million pounds of the polymer was turned out; next year's production should surpass 400 million pounds. Producers will feel less chary about expansion if pricing doesn't fall victim to political maneuvering.

Grass isn't growing under the feet of other plastics producers, either, as they plan to meet expanding needs in 1952.

## MARKET LETTER

### WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	122.5	122.2	117.2
Bituminous Coal Production (Daily Average, 1000 Tons)	1,811.0	1,846.0	1,914.0
Steel Ingot Production (Thousand Tons)	2,041.0	2,035.0	1,967.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	140.9	141.0	130.6
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	247.8	254.0	194.1
Chemical Process Industries Construction Awards (Eng. News-Record)	\$6,729,000	\$51,692,000	\$17,278,000

### MONTHLY INDICATORS—WHOLESALE PRICES (1926=100)

	Latest Month	Preceding Month	Year Ago
All Commodities (Other than Farm and Foods)	167.3	168.7	155.5
Chemicals and Allied Products	140.1	139.4	122.5
Chemicals	144.4	143.1	121.9
Drugs and Pharmaceuticals	184.6	184.7	135.0
Fertilizer Materials	117.8	119.0	112.1
Oils and Fats	139.8	139.3	142.7

Present demand for plastics is good, but the future holds even greater promise. The reasons are three: new products, new applications, and greater availability of raw materials. Keep an eye on developments in large moldings and structural plastics.

Benzene, vital to plastics growth, will be in better supply in 1952, thanks to new benzene-from-petroleum facilities. The most recent addition has just gone on stream for Standard of Indiana at its Whiting plant. Present capacity is 11 million gallons annually, but that will be upped to 16 million gallons a year around the middle of 1952.

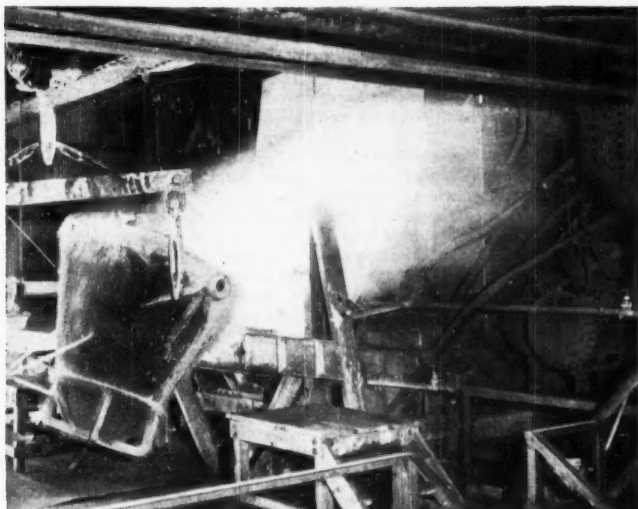
By that time, total U.S. capacity for petroleum benzene is expected to hit 60 million gallons. For the end of 1952, the time-table calls for 100 million gallons annual capacity of this petroleum-made product—nearly one-third of the entire benzene supply.

Consumers of phenol will find the supply pinch beginning to ease next year. Bakelite's new plant at Marietta, Ohio, is in operation; Barrett and Durez are due to come in by the end of 1952.

Almost every plastic material will be more abundant next year with the exception of phthalic anhydride. Demand for alkyds and plasticizers forges ahead, naphthalene supplies continue to bring up the rear. Flow of imported naphthalene is erratic, and prices are out of this world. Current quotations on the imported product are pegged at 16-17¢ a pound. With phthalic selling at a 21¢ ceiling, there's not much incentive for potential purchaser.

Those who use alkyds can look to three developments for supply relief, but these all require more time and more money. Take your choice: adding facilities for recovering naphthalene from coal tar; switching to ortho xylene instead of naphthalene; or using other anhydrides (e.g., maleic) that have a better supply outlook.

Insecticide producers have a different problem—not how to make it, but how to sell it. Fortunately, demand from overseas is spirited. Turkey's Economic Mission in Washington is reported to want nearly a million pounds of DDT, and other insecticides as well.



ZINC REFINING: Scant production, low ceilings harry chloride users.

## Chloride Sure to Follow

Consumers of zinc chloride play second fiddle in shortage of zinc scrap.

Defense needs boost zinc requirements, while unrealistic OPS price policy keeps imports out.

Zinc chloride has been getting progressively scarcer, but expected higher zinc prices may improve supplies later.

Each week the shortage of zinc chloride seems to become progressively worse. Its output depends on the supply of zinc scrap, and scrap is scarce because there isn't enough zinc to go around. The metal is doubly hard to come by because of the heavy defense demand plus the shrinkage of imports resulting from the price policy of the Office of Price Stabilization.

**Home Pay:** When any serious zinc shortage exists, the supply of scrap-for-chloride tends to disappear from the market, and chloride consumers do with less or without.

The crux of the zinc dearth is the price differential between the U.S. and the world market. Currently, domestic producers and others who sell to U.S. consumers can charge a ceiling of 19½¢ a pound, f.o.b. E. St. Louis. Until last week, the OPS-allowed price was 17½¢, same basis. In the meantime, the world market price is around 30¢ a pound, and foreign producers are none too anxious to sell over here. Importers who have paid higher prices abroad can't afford to sell at domestic ceilings, but some ex-

pect early relief by new OPS action.

**Facing It:** With higher price ceilings, more zinc will head toward the U.S. At the moment, however, even high-priority zinc users face pressing shortages due to growing demands for brass, die casting, and electroplating. Zinc chloride supplies are squeezed even harder, and worsening is possible despite the gradual improvement in availability of the metal.

Most of the zinc chloride used nowadays goes to make dry batteries, wood preservatives, and the treatment of textile fibers. But in addition, much of it goes into a host of smaller applications: manufacture of organic zinc salts, for flux, and in catalysis for petroleum refining and organic reactions. Probably some of these uses would have been partly replaced, except that most of the potential substitutes are in a similar position.

Actually the shortage of zinc chloride has been around for over a year, and some consumers are beginning to feel it's a normal state of affairs. In late 1950, the pinch was primarily due to the surprising short-



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**De Bear** 636 ELEVENTH AVE.  
INCORPORATED NEW YORK 19, N. Y.

**Triethanolamine**

WILLIAM D. NEUBERG CO., INC.  
420 Lexington Ave., New York 17, N. Y.  
ORegon 9-2550

**SOLVENTS RECLAIMED**

- Waste Batches
- Solvent Mixtures
- By-Products Recovered

**Aceto** **CHEMICAL  
COMPANY INC.**  
82 BEAVER ST., New York 5, N. Y.  
DIgby 4-9760

**CHEMICAL MARKETS**

age of muriatic acid, rather than the metal lack. But since the spring of 1951, shortage of zinc has been far and away the predominating factor. The pinch would be worse today were it not that the Office of International Trade has imposed restrictions on exports of this metal.

**Up Ahead:** Consumers of zinc chloride may have seen tougher days but they can't remember when. But more zinc is apt to become available later in the year as a result of more liberal OPS thinking. International agreements, particularly with Canada and Mexico, should also add to the supply of zinc. When these larger quantities become available, consumers of zinc chloride can expect to raise the ante to keep some coming their way.

**White: Not So Tight**

New production about to come on-stream will bring a loosening in the over-all availability of titanium dioxide pigments. Main easing will come in supply of extended titanium pigments (which contain 70% calcium sulfate). Pure pigments will continue tight for several months.

The new production of extended pigments will come from a capacity increase at the Sayreville, N.J., plant of National Lead's Titanium Division. The increase here, coupled with a slight easing in demand, may allow the company to abandon a rigid rationing system it had set up some time ago to insure fair supplies to all its customers.

Another factor in supply, not as imminent as the Sayreville increase but on the horizon will be availability of high titanium slag from Canada. The slag will be produced as a co-product with iron from the Sorel operations of the Quebec Iron & Titanium Corp.\*

Experimentation with Sorel slag is going on in the laboratories of titanium pigment producers, but none of them is talking about any commercial-scale slag purchases as yet.

**Capacity is Limit:** Each year, with the exception of the early '30s, 1941, 1942 and 1949, the titanium pigment industry has shown a production increase. The output in 1950 was up about 20% from 1948, the previous peak. CW's estimate of 1950 production: 350,000 tons. And this isn't the last increase; 1951 will be even higher.

National Lead and Du Pont are the two biggest factors in production—National Lead in extended pigments and Du Pont in pures. Also producing pure pigments are Cyanamid's Calco Division and the Chemical and Pigment Co., a division of Glidden.

Supply (which depends on capacity) has been racing to keep ahead of demand, which hasn't been any slow mover.

With each increase in capacity, mining of ilmenite, the basic raw material, has increased. Domestic supplies take care of about half of the needs. Imports—mainly from India—account for

\* Jointly owned subsidiary of Kennecott Copper and New Jersey Zinc.

**GOVERNMENT AWARDS**

Item	Supplier	Location
U.S. Navy Purchasing Office, 1206 South Santee Street, Los Angeles 15, California:		
Laundry & dry cleaning supplies, bleach, press cover, powdered soap.	H. Kohnstamm & Co.	Los Angeles, Cal.
Laundry supplies: bluing, liquid soap, powdered starch	Chem-Tex Div. of Calif.	Los Angeles, Cal.
Armed Services Medical Procurement Agency, 84 Sands Street, Brooklyn 1, New York:		
Nitrofurazone ointment, water-soluble	Easton Laboratories Inc.	Norwich, N. Y.
Thiopental sodium, trimethadione injection	Abbott Laboratories	N. Chicago, Ill.
Papaverine, hypochloride tablet, amobarbital sodium capsules	Eli Lilly & Co.	Indianapolis, Ind.
Glycerin	Armour & Co.	Chicago, Ill.
	Western Associates, Inc.	San Carlos, Calif.
Triptelenamine hydrochloride, tablets	Ciba Pharmaceutical Prod., Inc.	Summit, N. J.

**GOVERNMENT NEEDS**

Bid Closing	Invitation No.	Quantity	Item
Philadelphia District, Corps of Engineers, 121 N. Broad St., Philadelphia, Pa.:			
Oct. 22	(ENG-36-109-52-SOB)	4,500 M cu ft	Gas, acetylene, bulk
Veterans Administration, Washington 25, D.C.:			
Oct. 22	A-24	624 btl	Zinc oxide, 1 lb.
	A-24	4,920 btl	Xylene, 1 lb.
	A-24	1,152 btl	Trichloroacetic acid
	A-24	384 btl	Sulfosalicylic acid, ¼ lb.
	A-24	192 btl	Sodium B-glycerophosphate
	A-24	600 btl	Sodium citrate, 1 lb.
Commandant of the Marine Corps, Washington, D.C.:			
Oct. 26	268B		Disinfectant, cresolic (tentative Marine Corps specs. 28/20142)

the rest. The imported material has a higher  $\text{TiO}_2$  content (55%) than domestic (45%).

A 70% dioxide content will be available to processors, once Sorel begins operation. Both the concentration and nearness to the U.S. are freight-cost advantages. In time of war, such a Canadian source would be even more valuable.

**Sulfuric Tie-In:** Production of titanium dioxide pigments takes an appreciable amount of sulfuric acid. Less would be needed if high-titanium slag were used. Despite the shortage of this useful chemical, pigment makers report that their production was not limited by sulfuric supply.

Sulfuric is used to separate titanium dioxide from iron salts and other impurities. Use of high-titanium slag would eliminate need for the tedious separation of iron salts. (The process: reduction with scrap iron to ferrous sulfate and separation by crystallization.) Cost and processing time would be cut, and the major headache of finding a market for by-product ferrous sulfate would be eliminated.

Full-scale production at Sorel is scheduled for next June. Potential slag output of the five electric furnaces now a-building is 274,000 tons per year. This production, assuming current recovery rates, would equal about 190,000 tons of  $\text{TiO}_2$  pigment.

A long-term factor affecting availability of this titanium, however, is the increasing production of titanium metal. At present, though, the amount needed for metal is but a smidgen of pigment production needs.

**Over-all Picture:** Main buyers of titanium pigments are paint manufacturers, who consume almost four-fifths of the production. Other uses are found in whitening or opacifying paper, rubber, and various floor covering materials.

There's no reason to believe that the steady increase in demand for dioxide pigments during past years won't continue. One factor in this increase has been the relative tightness in other white pigments. Lead supplies, for example, have been the limiting factor on production of such pigments as white lead. Only place where lead and titanium pigments are interchangeable is in the paint field, but even here not in all cases.

The titanium pigment demand picture is a bright one for suppliers. For buyers—especially those who need pure pigments—the short-range picture isn't that happy. It looks, however, as if within a year's time supply may just about have caught up with demand.

### menadione, u.s.p. xiv

oil soluble vitamin k useful in hemorrhagic diseases, diatheses due to low thrombin content.

### digitoxin, u.s.p. xiv

in cardiac therapy.

### monobromated camphor

useful in certain chronic neurologic conditions.

### propyl gallate

an anti-oxidant for edible animal fats.

### albumin tannate, medicinal

useful in control of intestinal disturbances.

### dichloran

Lauryl dimethyl dichlorobenzyl ammonium chloride. Supplied in 10% and 50% concentrations as aqueous solution and 100% as a viscous water soluble material. The already high phenol coefficient of quaternaries is increased in this product because of the chlorines on the aromatic component. We also manufacture other quaternary ammonium compounds.

write for our catalog

**fine organics, inc.**

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**BUTYL "CELLOSOLVE" STEARATE**

**METHYL "CELLOSOLVE" OLEATE**

**DIBUTYL TARTRATE**

\*TRADE MARK OF C & CC DIV.

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OLEATES

PALMITATES  
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LAURATES

for the

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**Petroleum, Plastic and Allied Industries**

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# SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

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**POSITION WANTED** and **Individual Selling** Opportunity undisplayed rate is one-half of above rate, payable in advance.

**PROPOSALS**, \$1.20 a line on insertion.

NEW ADVERTISEMENTS received by 10 A.M. October 31st at the New York Office, 330 W. 42nd St., New York 18, N. Y., will appear in the November 3rd issue subject to limitations of space available

## INFORMATION

BOX NUMBERS count as one additional line in undisplayed ads.

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PRODUCTS COMPANY, INC.

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BAxley 7-0600

## WANTED ASSISTANT SALES MANAGER

Well-rated organic chemical manufacturing company, specializing in synthetic detergents, requires assistant sales manager.

If you have an organic chemical background, a successful sales record, and believe you can analyze sales potentials, plan and promote the sale of new products, and develop salesmen, it may pay you to write us today. All replies will be held confidential.

Please send a complete resume, including education, experience, age and salary desired to

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**SALESMAN**, experienced industrial chemicals. Permanent position, metropolitan New York territory, with well known, aggressive chemical distributor and manufacturers' sales agent, established 30 years. Reply giving qualifications, references, salary expected.

SW 2203 Chemical Week  
330 W. 42 St., New York 18, N. Y.

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Chemical concern in recently completed modern plant wants products for development, manufacture or merchandising. Replies will be held strictly confidential.

P. O. Box 256,  
Wakefield, Massachusetts

## ENGINEERS Chemical—Mechanical

For product development, production supervision, engineering and maintenance. Some experience in fine grinding of chemicals, minerals, insecticides with Raymond, Williams and fluid energy mills desirable. B.S. degree and 3-6 years industrial experience required. Unusual opportunity for individual initiative and advancement in small, rapidly growing unit of large corporation. Please write complete record of experience, education, salary, references.

P2222 Chemical Week  
330 W. 42 St., New York 18, N. Y.

## FOR SALE ROLL DRYER — NEARLY NEW

One Bufflovak Model F Roll Dryer, 42 inch by 120 inch rolls, complete with motor, separate reduction gear unit, includes stainless steel conveyors, hood, shields, etcetera. The unit also includes complete stainless steel floater, pulverizer, shaker, and grinder plus a Cochrane Becker condensate return system and platform scale. Dryer is rated at 600 lbs. dry skim milk powder per hour.

Will consider any reasonable offer. For further information reply to

FS 2133 Chemical Week  
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The recognized national medium for the disposal of used or surplus new equipment; for the advertising of positions wanted or vacant; of business opportunities, etc. are the

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# READER SERVICE

## HOW TO USE COUPON

Circle page numbers of items about which you want more details. Then write your name and address on the coupon at the bottom of the page and mail it to us. Your request will be forwarded to companies concerned, the answer coming direct to you.

## MAKES IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

## THE NUMBERS

**Advertisements:**—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R, T, B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

**Editorial Items:**—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

## EDITORIAL ITEMS

For more data, circle number on coupon

### NEW PRODUCTS

Cyclocumol 26A

### NEW EQUIPMENT

Experimental Motor 32C  
Heating Tape 32A  
High Pressure Pump 32B  
Radiation Probe 32D  
Vacuum Pumps 32E

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Coal-Derived Chemicals 52A  
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Check Valves 52I  
Electric Contact Controllers 52D  
Electric Heaters 52E  
Flow Signal Transmitter 52F  
Tantalum Equipment 52C  
Tube Fittings 52H

### PRODUCTS ADVERTISED

Batteries, flashlight 9b  
Chemicals

Albumin tannate, medicinal T49e

Alcohol esters AE-1	22-23c	Specialties	B49
Aminopropyl morpholine	54c	Synthetic resins	53
Anhydrous Ammonia	41	Synthetic waxes	B32
Armofos (tripoly)	34d	Tetrachloro phthalic anhydride	18g
Aromatic	19	Tetrasodium pyrophosphate	34a
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Caustic potash	18b	Triethylenylene	18f
Caustic soda	18e, 33	Triethyl phosphate	31
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Fatty acids	39	Polyethylene liners & bags	T61a
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Liquid chlorine	18a	Ferro metal alloys	37a
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Ortho phenylphenol			
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Perfumes	B40a		
Petroleum sulfonates	T42c		
Petrolatums	T42b		
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## READER SERVICE COUPON

Mail to Chemical Week, 330 W. 42nd St., N. Y. 18, N. Y.

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POSITION \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY & STATE \_\_\_\_\_

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Expires December 20, 1952

# BOOKLETS . . . . .

## Chemicals

### Coal-Derived Chemicals

12-p. bulletin describing the firm's line of coal-derived chemicals—coal chemicals, plasticizers, activated carbons, protective coatings and agricultural chemicals—with reference to their specifications, uses and applications. Pittsburgh Coke & Chemical Co.

### Glyoxal and Pyruvic Aldehyde

8-p. technical bulletin giving information on the physical and chemical properties, specifications, shipping data, industrial uses, suggested formulations, reactions, and potential applications of glyoxal, a chemical compound whose industrial value depends primarily on its insolubilizing action, and pyruvic aldehyde which contains two highly reactive carbonyl groups. Carbide and Carbon Chemicals Co.

## Equipment

### Tantalum Equipment

28-p. booklet concerned with acid-proof tantalum equipment for use in corrosive processes in the chemical industry; data is given here on the physical and chem-

ical properties, of tantalum, in addition to engineering descriptions of single and multiple tube bayonet heaters, coils, heat exchangers, condensers, hydrochloric acid absorbers, instrument protection, tubing and fittings. Fansteel Metallurgical Corp.

### Electric Contact Controllers

16-p. bulletin discussing operating principles, specifications and control features of vane-type electric contact controllers (such as indicating and recording controllers, potentiometers, electronic control millivoltmeter pyrometer and excess temperature safety controller) and listing other types of control instruments. Minneapolis-Honeywell Regulator Co.

### Electric Heaters

4-p. folder covering line of "packaged" immersion, circulation, and other electric heaters having built-in controls, for use in the chemical, plastics, petroleum and related industries. Edwin L. Wiegand Co.

### Flow Signal Transmitter

8-p. brochure discussing construction, operation and applications of flow signal transmitter, a pneumatically operated pressure-differential measuring unit which

transmits proportional signals to remote recording or indicating instruments, or to automatic control elements. Hagan Corp.

### Brass and Copper Alloys

4-p. folder designed to aid those in the metal working industry and other fields to distinguish between copper base alloys; listed are 65 commonly used brass and copper alloys along with their composition, properties, forms and typical uses. Bridgeport Brass Co.

### Tube Fittings

12-p. bulletin containing dimensional information, cross section drawings, installation recommendations and assembly instructions for the firm's line of tube fittings—available in brass, aluminum, steel, stainless steel and monel. Crawford Fitting Co.

### Check Valves

4-p. bulletin presenting technical data, cut-away versions of two types of valves and a series of installation photographs of firm's check valves which are designed to eliminate noise as well as to prevent pressure surges which often damage piping systems. Williams Gauge Co.

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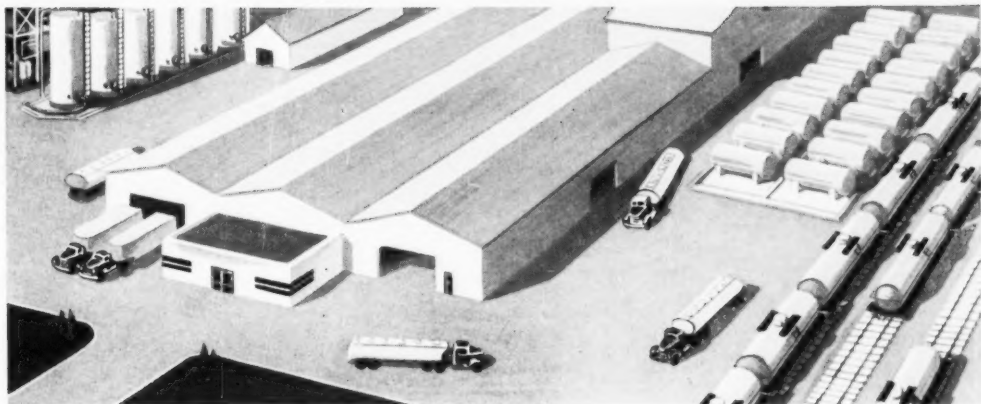
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New York 18	Knox Armstrong, Robert S. Muller, Charles L. Todaro, 330 West 42 St.
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San Francisco 4	Ralph E. Dorland, 68 Post St.
Boston 16	1427 Statler Bldg.
Detroit 26	856 Penobscot Bldg.
Pittsburgh 22	738 Oliver Bldg.
St. Louis 8	3615 Olive St., Continental Bldg.

# MICA

## WATERGROUND and MICRO

Mica—a flaky mineral filler for use in Plastics, Paints, Special Cements, Rubber and Asphalt Compounds where its particular properties such as thermal and electrical insulation, transparency, toughness, flexibility and chemical inertness are of value.

**THE ENGLISH MICA CO.**  
STERLING BUILDING, STAMFORD, CONN.



Quality production  
starts with quality supply, so...

**RCI**  
supplies itself!

If you could observe the railroad siding or truck dock of any of RCI's domestic plants, you'd witness an excellent example of a self-integrated manufacturing operation at work. You might see a shipment of phenol arriving from Tuscaloosa, Alabama, phthalic anhydride from Detroit, or maleic anhydride from Elizabeth, New Jersey. But whichever of these you saw, you'd discover that the supplier was RCI itself—for RCI maintains its own supply plants from which come most of the basic ingredients that make

up the RCI line of synthetic resins. That's why you can always count on top quality and constant uniformity when you deal with RCI. For within these plants, RCI sets its own specifications and maintains its own systems of rigid quality control that assure raw materials exactly tailored to the needs of finished resins. And that means resins exactly tailored to the needs of your surface coatings. So why not follow the lead of leading formulators—for resins you can trust, buy RCI!

REICHOULD CHEMICALS, INC.



Executive Offices, International Building, New York 20, N.Y.  
Main Plant, Detroit 20, Michigan

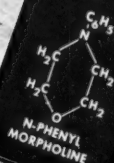
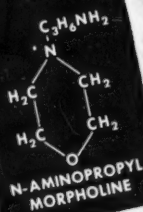
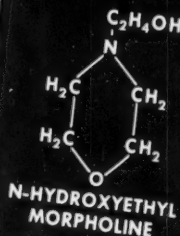
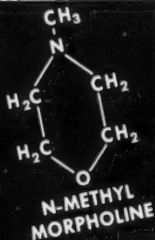
Other Plants: Brooklyn, New York

Elizabeth, New Jersey • South San Francisco and Azusa, California • Tuscaloosa, Alabama • Seattle, Washington • Chicago, Illinois • Charlotte, N. C.  
Liverpool, England • Paris, France • Sydney, Australia • Sassenheim and Apeldoorn, Holland • Naples, Italy • Buenos Aires, Argentina • Hamburg, Germany  
Toronto and Port Moody, Canada • East London, South Africa • Osaka, Japan • Werdorf, Austria • Gothenburg, Sweden • Zurich, Switzerland

**SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • PHENOL • GLYCERINE**  
**PHTHALIC ANHYDRIDE • MALEIC ANHYDRIDE • SODIUM SULFATE • SODIUM SULFITE**

# Ring Up Future Profits

using Morpholine  
Derivatives in your product



Few other groups of organic chemicals have the diverse solvent powers of the N-substituted morpholines. The fact that they are both ethers and tertiary amines (N-Hydroxyethyl Morpholine is also an alcohol) probably accounts for the unique solvent activity that gives them such wide potential use.

## HERE'S HOW YOU CAN USE THEM:

- In the manufacture of dyestuffs, pharmaceuticals, corrosion inhibitors, emulsifying agents, and synthetic resins.
- Methyl Morpholine for the preparation of self-polishing wax and oil emulsions.
- Esters of Hydroxyethyl Morpholine as emulsifiers in metal-cutting oils and textile oils.
- Phenyl Morpholine for the preparation of dyes and as a corrosion inhibitor for tin alloys.

Methyl, Aminopropyl, and Phenyl Morpholines are available in commercial quantities for immediate delivery. Hydroxyethyl Morpholine is available in research quantities. Investigate them now. Ask for samples and the technical bulletins: F-5732, "Morpholine and Morpholine Derivatives"; and F-7430, "Aminopropyl Morpholine."

When you are considering the use of amines, remember that CARBIDE supplies more than 60 other amines. For a complete list of these amines, ask for our new 1952 edition of "Physical Properties of Synthetic Organic Chemicals" (F-6136).

*Other  
Amines* →

Offices in Principal Cities

In Canada:

Carbide and Carbon Chemicals, Limited, Toronto